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Contents

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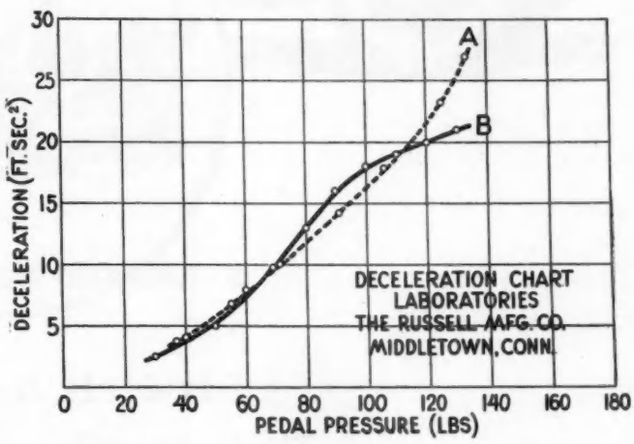
•Do road tests check laboratory curves?

• An important factor in enabling Rusco engineers to provide brake linings to meet any desired deceleration curve is due to the use of highly accurate testing equipment.



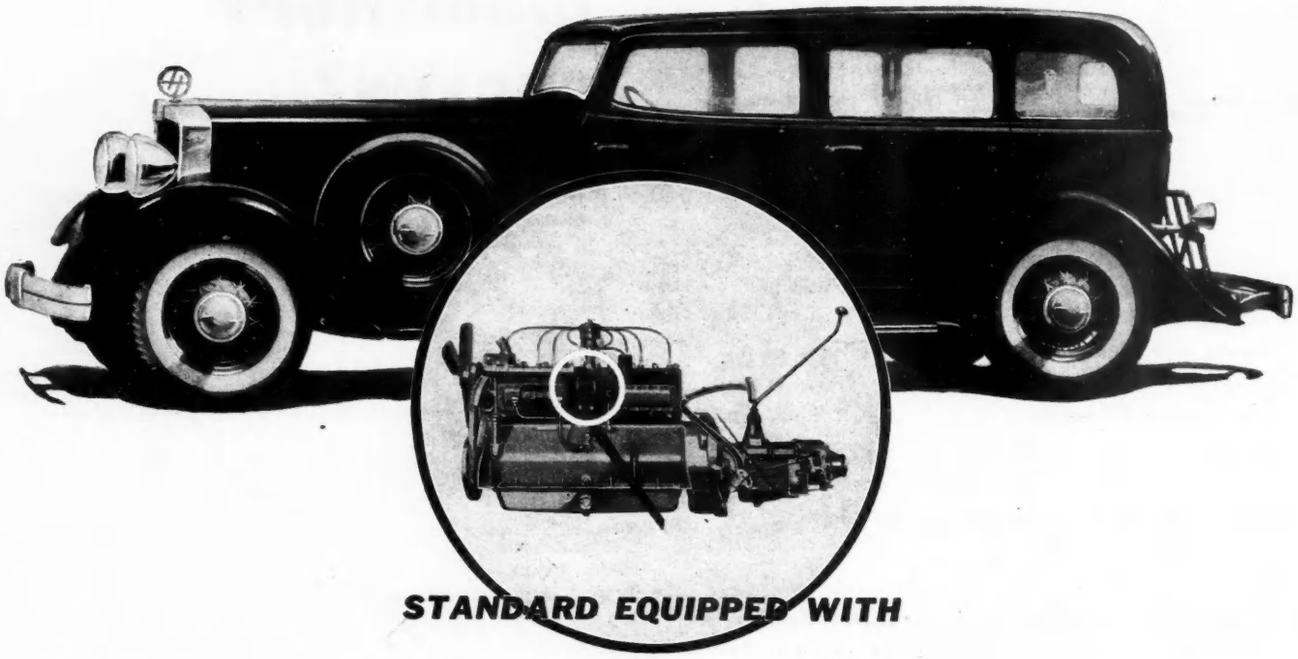
Data: Brake 12 inch mechanical; car weight, 3800 lbs.; speed 40 M.P.H.; machine pedal pressure factor 3.58; lining, same type Rusco both tests.

The accompanying chart affords an excellent illustration of the accuracy with which the Rusco test machines predict actual operating conditions on a car. Line A represents the curve for the test machine, while Line B indicates the car test made with the same linings and the same brake.

It will be noted that the curves fairly approximate each other, especially up to 100 pounds pressure and 18 ft. deceleration, at which point the car curve slopes away from the machine curve. This is due to the fact that the car test is affected by wheel slippage, which is not a factor in the machine test. The directional values of the two curves, however, are substantially the same.

Complete charts showing pedal pressure, deceleration and other performance data on Rusco linings for your brake will be furnished gladly upon request. Address Engineering Department C-8. The Russell Manufacturing Company, Middletown, Conn.

THE HUPMOBILE EIGHT



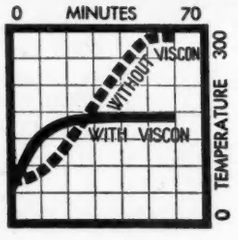
STANDARD EQUIPPED WITH

THE HARRISON

VISCON

OIL TEMPERATURE REGULATOR

Quick oil warm-up in cold weather, controlled oil temperature in hot weather, better lubrication and reduced oil consumption at all times—these are some of the advantages and economies enjoyed by owners of the Hupmobile Eight as a result of the Harrison Viscon. Tests show that the Viscon keeps the temperature of the oil within 15°-20° of the temperature of the water. Such effective oil temperature regulation results in so many operating improvements that more and more manufacturers of quality motor cars are adopting the Harrison Viscon as standard equipment.



At left—the warm weather cooling curve shows how the Harrison Viscon prevents the oil from reaching dangerously high temperatures, even at sustained high speeds.

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HARRISON RADIATOR CORPORATION

LOCKPORT, NEW YORK

AUTOMOTIVE INDUSTRIES

Vol. 67, No. 9 • THIRTY-FOURTH YEAR • August 27, 1932

Free Trade Granted to Dominions By Britain in Ottawa Agreement

Houses of Parliament, London, where the pacts signed by representatives of the British Empire will be acted upon soon, may become the nerve-center of the greatest trade combine known in the history of mankind

Legislators, in eight British Dominion Parliaments, will decide what part their countries will play in the accords reached in Ottawa by members of the Imperial Economic Conference, just adjourned

By Leslie Peat

BRITANNIA'S first move to establishing a world-wide economic empire was written into history Saturday, Aug. 20, when the Ottawa Imperial Conference closed with the signing of 13 inter-Dominion trade compacts.

The parliaments of Great Britain, Canada, Australia, New Zealand, South Africa, Newfoundland, Southern Rhodesia, India and the Irish Free State will meet in their respective capitols soon to affirm or reject the agreements and commodity schedules set up by the conference after weeks of stormy work on the part of their representatives.

Although all of the major agreements have not been

published, the decisions of the plenary group may be summed up as follows:

1. Great Britain grants free trade among its Dominions by maintaining its present tariff wall against foreign nations, surrendering her right to impose duties on imports from her Dominions.

2. In return, the Dominions agree to give new preferences to the manufactured exports of Great Britian, and in many cases to give them free entry, imposing protective tariffs on similar goods manufactured in foreign countries.

3. The entire inter-Dominion trade pact, or any part thereof, may be abrogated in 1937 if the participating governments find them unsuccessful in building the industry and commerce of the British Empire or the individual Dominions.

Thus Great Britain, through its powerful spokesman, Stanley Baldwin, one-time prime minister and now president of the Imperial Conference, has surrendered the most important plank in its economic structure, namely, the right after next November to impose tariffs on Dominion imports, such as are placed upon foreign importations of a like character.

This part of the new arrangement applies particularly to Canada because it is the most industrially dedeveloped of all the Dominions.

Canada now agrees to let in 220 different British commodities either duty free or with added preferences to enable them to compete not only with foreign goods but with some of the steel and other factory products which Canada is making.

Motor vehicles, parts and accessories take an important place in this schedule, since this industry has been comparatively well developed in Canada.

Generally speaking, the removal of the Canadian duty on imports of cars, trucks, buses, parts and accessories from Great Britain will mean an average increase in preferential treatment for the British industry of 15 per cent as against imports from the United States.

Customs records for the first six months of 1932, just released, show that Canada imported 1088 automobiles during the period, practically all of which were from the United States. This is a comparatively small figure but this is a low year. The total of automobile imports for the first half of 1931 was 7558, of which almost all were from the states.

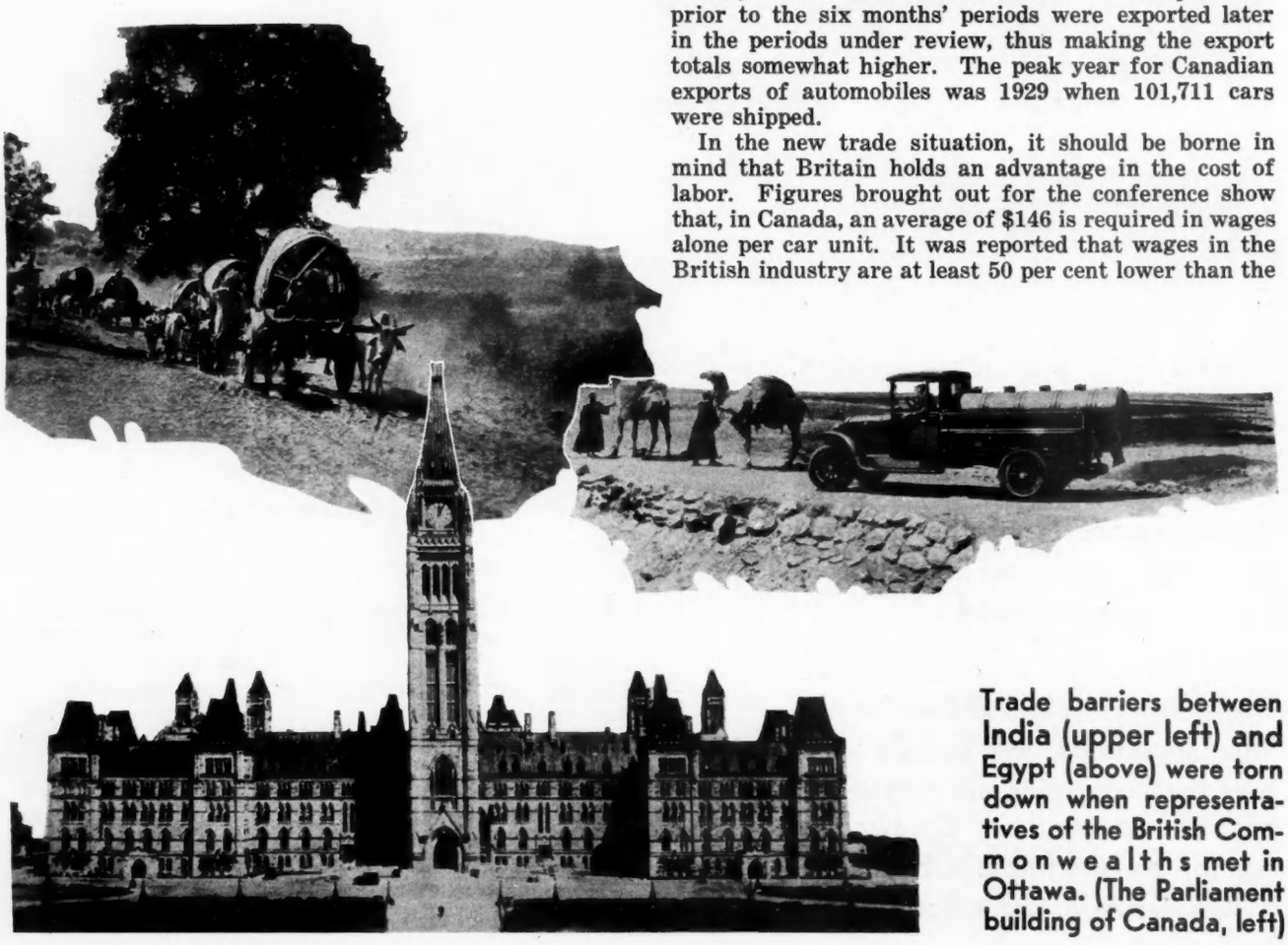
Consideration must also be given to the fact that relatively more cars are being built in Canada than was the case one year ago, various branch factories of U. S. companies having been established in the Dominion in the past 12 months.

Registration figures for Canada so far this year show that 89.06 per cent of the automobiles purchased in the Dominion were Canadian-made, this being the highest percentage on record.

Canada has a favorable trade balance when both imports and exports of automobiles are considered. During the first six months of 1932, Canada exported 3119 cars, as compared with imports of 1088. For the first half of 1931, the figures were 10,451 and 7558 respectively. The Canadian automobile industry produced 39,669 cars all told for the first half of the current year, as compared with 66,085 for the 1931 period, the production for sale in Canada for the two periods being 36,964 and 56,783 respectively.

There is an obvious discrepancy in these figures, as record, for the reason that a number of cars produced prior to the six months' periods were exported later in the periods under review, thus making the export totals somewhat higher. The peak year for Canadian exports of automobiles was 1929 when 101,711 cars were shipped.

In the new trade situation, it should be borne in mind that Britain holds an advantage in the cost of labor. Figures brought out for the conference show that, in Canada, an average of $146 is required in wages alone per car unit. It was reported that wages in the British industry are at least 50 per cent lower than the



Trade barriers between India (upper left) and Egypt (above) were torn down when representatives of the British Commonwealths met in Ottawa. (The Parliament building of Canada, left)

prevailing rates in Canada. There are many factors that make the outlook very interesting, to say the least. It is possible that the automobile business in Canada will be finding it necessary to make a new start in a literal sense.

That the work of the Imperial Conference, which opened on July 21, will have hard going in the nine parliaments which were represented is conceded by even the most optimistic confreres.

Many strong opposition leaders throughout the empire do not feel that the conference was justified in the first place.

The prime object of the conference was to amplify the existing preference arrangements in such a manner as to furnish a complete Imperial tariff system. It opened with a discussion of the possibilities of a so-called rationalization agreement by the Dominions as far as manufacturing industries were concerned.

Rationalization would apply within the empire something akin to the international industrial cartel system which has been partially applied on the continent of Europe. It would recognize the right of countries within the empire to have the biggest production quotas in lines of manufacture in which they excel as to superior facilities, efficiency, and cheapness of process.

And governments have risen and fallen on this very question, as the nations of Europe and members of the British family of commonwealths have debated the justification of legislating national economic structures.

The Ottawa Conference was held in pursuance of the decision of the Imperial Conference which met at London on Oct. 2, 1930, and in which the leading role was taken by Prime Minister Bennett, of Canada.

World depression having already set in, economic problems were foremost in the minds of the delegates, although in his opening address Prime Minister MacDonald placed them last, subordinating them to constitutional issues and the promotion of world peace.

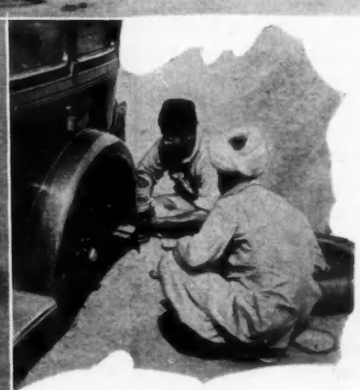
Mr. Bennett offered in behalf of Canada, and in order to promote the formation of a universal preference system throughout the empire, to grant to products of Great Britain and of all other parts of the empire a preference in the Canadian market, in exchange for a like preference in the other markets within the empire, on the basis of a ten per cent increase in prevailing general tariffs or in tariffs later to be enacted.

Thus the "platform," so to speak, of the Ottawa Conference was established and major points of the agenda were set up by an eminently successful business man

(*Turn to page 283, please*)

" . . . and never the twain shall meet . . . "

The Ottawa Conference upset Kipling's poetic thoughts, when a meeting of governments gave British Oriental peoples important economic preferences on the part of Occidental Dominions



Toe-In Will Not Neutralize Scuffing E

For best service, wheels must be absolutely parallel with each other and perpendicular to road.

Small camber required to compensate for flexure of axle under load and a slight toe-in, to offset spreading of wheels in front due to rolling resistance

IN connection with the study of wheel-alignment problems by a subcommittee of the S.A.E. Research Committee the suggestion has been made that someone should make a mathematical analysis of the best relation between axle camber, toe-in, and caster.

The implication seems to be that toe-in is an antidote, as it were, for the evil effects of camber, and that its effectiveness in eliminating these effects is dependent upon caster, the amount of toe-in required to correct a given camber varying with the amount of caster.

In tracing the origin of axle camber in automobiles, we find that it was taken over from horse-vehicle practice. All of the older horse vehicles had wooden wheels with dished spokes; that is, the spokes of the wheels, instead of being set perpendicular to the wheel axis, were set at a slight angle to the perpendicular plane, so that they formed a cone of small height.

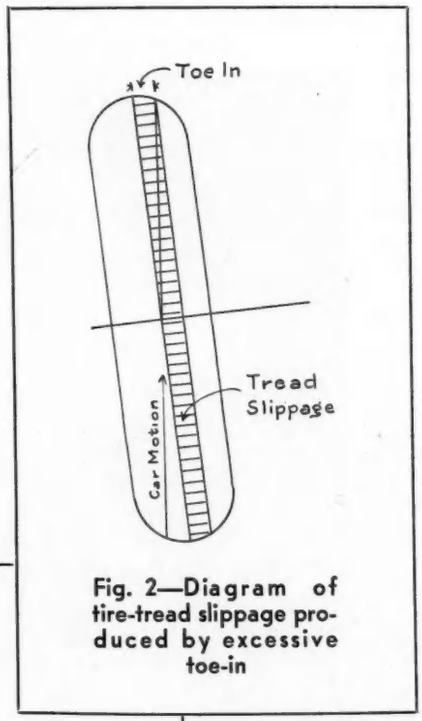


Fig. 2—Diagram of tire-tread slippage produced by excessive toe-in

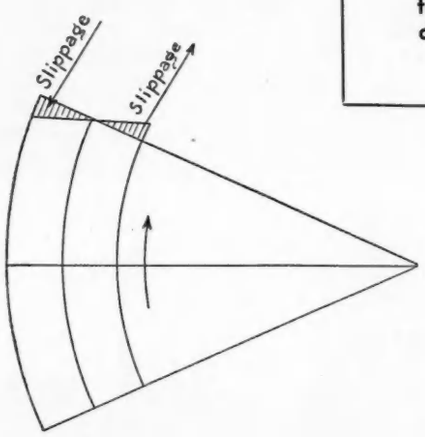


Fig. 1—Diagram of tire-tread slippage produced by excessive axle camber

The parts of the wood wheel were firmly held together by the steel tire, and the wheel in consequence offered great resistance to deformation by lateral shocks in the direction from the base toward the top of the cone, the stresses in the spokes due to such shocks being almost entirely compression stresses. The greatest dish was used in wheels for heavy vehicles compelled to travel over rough ground, such as gun carriages.

Lateral strength thus resulted naturally from dishing of the wheels. In order that the wheels might be as resistant as possible also to vertical loads, it was necessary to so arrange matters that the spokes at the bottom of the wheel, which carried this load, were in a vertical position, and this meant inclining the axle spindle on which the wheel revolved, or, in other words, giving the axle a camber.

In a few of the early automobiles with shaft drive, the driving axle was cambered for the benefit of the wooden wheels, but this involved considerable complication in the driving parts of the axle. It has now become customary to have the driving axle straight, and even where wood wheels are used they are no longer dished. With undished or plane wheels there is no need for camber, but the practice of cambering the front axle continues, and so does the practice of giving the front wheels a toe-in. The belief seems general that this toe-in serves to compensate for the effect of camber on the tires. But does it?

A wheel rolling on the spindle of a cambered axle tends to run in a circle, because the radii at opposite sides of the ground-contact area of the tire tread are not equal. The radius from the outermost point of contact is smaller than that from the innermost point, and as a result the wheel tends to describe a circle on the ground, rolling away from the direction of car travel. If the wheel is constrained to follow a straight course, since the radii at the inner and outer edges of

Effects of Camber

by P. M. Heldt

the tread are different but both portions of the tread must advance the same distance per revolution, it is obvious that there must be slippage of the tread on the ground.

Either the outer portion of the tread, which has the smallest effective diameter, must slip forward on the ground, or the inner portion must slip backward, or both. Whatever slippage occurs therefore is in a circumferential direction. This is illustrated in Fig. 1. herewith.

The only logical reason for camber of the axle is that under the load on it the axle sags or flexes slightly, which tends to cause the wheels to spread apart at the bottom. This applies to the rear wheels as well as the front ones. The rear wheels, however, are more nearly hidden from view by the fenders, and, besides, prevention of wheel spread by cambering of the driving axle involves so much complication that it is not considered worth while. None of the driving axles used on American passenger cars have camber, and there is no evidence that the tires suffer appreciably in consequence.

In the case of front axles the practice of cambering continues, although the amount of camber given them has been gradually decreased. The average camber in modern American passenger car axles is about 1½ deg. It is interesting in this connection to determine the angle assumed by the wheel spindles as a result of the elastic deflection of the axle under load.

When a beam is thus elastically deflected, it assumes a curved form, and the radius of curvature at any point along its length is EI/M, where E is the modulus of elasticity of the material (30,000,000 for steel); I the moment of inertia of the cross section, and M the bending moment at the particular point.

In a front axle the bending moment is constant between the centers of spring supports, hence this part of the axle is bent into an arc of a circle. From the spring saddles outward the bending moments decrease uniformly, and the radius of curvature therefore increases until at the center of the wheel it becomes infinite. The moments on the axle are represented diagrammatically in Fig. 3.

In seeking to determine the angular deflection of the axle spindles we will not be far wrong in assuming that it is the same as if the uniform moment acting on that portion of the axle center between spring supports continued from the supports outward about half

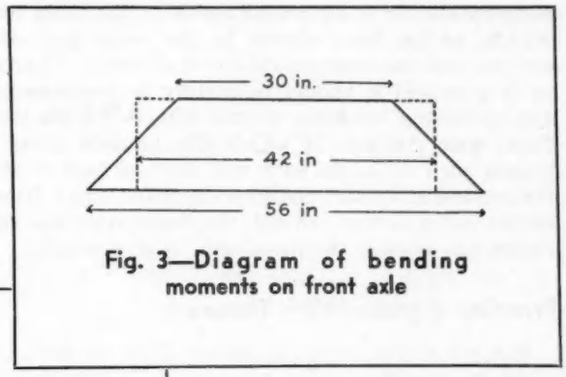


Fig. 3—Diagram of bending moments on front axle

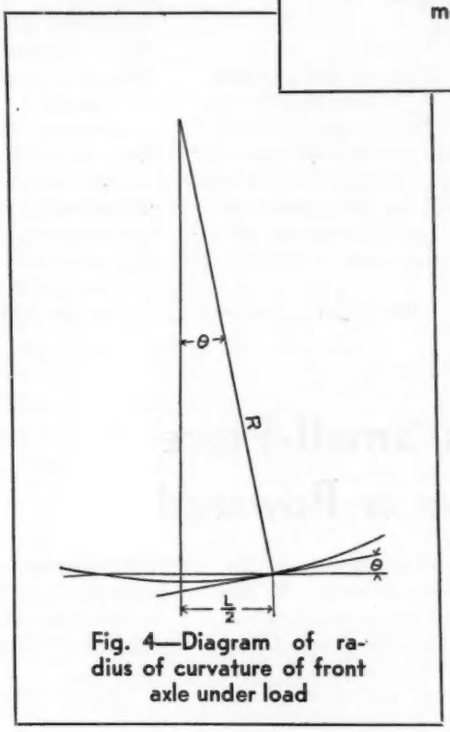


Fig. 4—Diagram of radius of curvature of front axle under load

the distance to the wheel center, or, say, over a total length of 42 in., the tread being 56 in. and the spring center distance about 30 in.

A typical front axle is the 1¾-in. size (with an I-section 1¾ in. high), with a section moment of inertia of 0.43 in. 4 and a section modulus of 0.504. When loaded to a maximum stress of 12,000 lb. per sq. in., the bending moment on the center section will be 6050 lb.-in. The radius of curvature R of the center section when thus loaded evidently will be

$$\frac{30{,}000{,}000 \times 0.43}{6050} = 2130 \text{ in.}$$

The arc of this radius is 42 in. long, hence one half of it is 21 in. long. The geometrical relations are represented—rather out of proportion for the sake of clearness—in Fig. 4. The angle θ between the axle spindle and the horizontal then is such that

$$\sin \theta = 21/2130 = 0.01$$

This is the sine of an angle of about 38 minutes.

The clearance between the knuckle and knuckle pin will add slightly to the deflection of the knuckle spindle, and it would seem, therefore, that if the steering knuckles were designed for a camber with the limiting values of ¾ deg. and 1 deg. the spindles would, for all practical purposes, be parallel with the vehicle supporting surface when the axle is under load. This is somewhat less than the camber now generally specified, the average for all American passenger-car axles being about 1½ deg.

The effect of caster on camber and toe-in has been mentioned. This can readily be shown to be quite negligible. The average caster of American passenger car front axles is about 2 deg. Now consider an axle which has a camber of 1 deg. and no toe-in. By swinging the axle around its axis through an angle of 2 deg. the sine of the camber angle (0.0174) is reduced in the proportion of 1 to the cosine of 2 deg. (0.9994), which is a reduction of less than 1 in 1000. Practically the same applies to the effect of caster on the toe-in. Since all camber is removed or compensated for by the deflection under load, there is no need seeking to

compensate for it by giving toe-in to the front wheels, which, as has been shown in the early part of this article, will not compensate for it anyway. If any toe-in is provided it should be merely to compensate for the spreading tendency of the wheels. With modern front axle designs in which the knuckle pivot axis makes such an angle with the vertical that it strikes the ground at a short distance (perhaps 1 in.) from the center point of tire contact, the moment of the rolling resistance around the pivot axis is very small.

Practice Agrees With Theory

Since a slight toe-in is better than no toe-in, and since in manufacturing practice it is customary to allow tolerances it would seem that toe-in specifications of 0-1/16 in. measured on the wheel rim at axle center height would meet the requirements best. This is in accordance with the findings of George M. Sprouls of the Goodyear Tire & Rubber Co. who observed the effects of camber and toe-in on tire wear in 45 different cars.

These cars were divided into three equal groups having cambers of 0, 2, and 4 deg. respectively. Each group was subdivided into three groups having toe-in settings of 0 to 1/16, 3/16 to ¼ and ⅜ to 7/16 in. respectively. The caster angle was kept constant.

All these cars were driven the same distance of about 20,000 miles, and the tire wear was measured. The group having no camber and 0-1/16-in. toe-in showed the least wear. While it is not stated in the report of the S.A.E. Subcommittee on Wheel Alignment from which this information is taken how the camber was determined, it is to be presumed that it was measured while the axle was under load. As shown in the foregoing, this is likely to be about 1 deg. less than the camber allowed for in the design, owing to flexing of the axle.

Summarizing the foregoing, the tires will show the least wear if while the car is in motion the two front wheels are absolutely parallel with each other and perpendicular to the rolling surface (assuming this to be plane); and camber and toe-in provided for in manufacture should be sufficient only to compensate for the deflection of the axle under load and the spreading of the wheels at the front by the rolling resistance.

Wazau Develops Small-Piece Tester; Hand-Drive or Powered

THIS machine, which is sold in this country by the Baldwin-Southwark Corp., Philadelphia, is designed for testing small pieces, such as wire, wood, porcelain, etc., in tension and compression, under transverse stresses, and for Brinell hardness. It is of the gooseneck type, having a lever-pendulum weighing system. It is a self-contained unit of the direct-reading and recording type. The machine has five ranges of sensitivity, viz., 500, 1000, 2000, 5000 and 10,000 lb. The vertical opening is 0 to 20 in., while the distance between the axis of the specimen and the machine frame is 3 in.

The load is weighed by a double pendulum-lever balance on which patents have been applied for, we understand. In the high-load ranges both pendula are used together, while for small loads the lower pendulum is disconnected. This is claimed to afford two advantages, namely, that at small loads the friction is minimized, whereby the sensitivity is increased, and that the inertia effect is greatly reduced, by using two short instead of a single long pendulum.

The levers of the weighing system are supported in ball bearings, which is made possible by the use of ample lever distances.

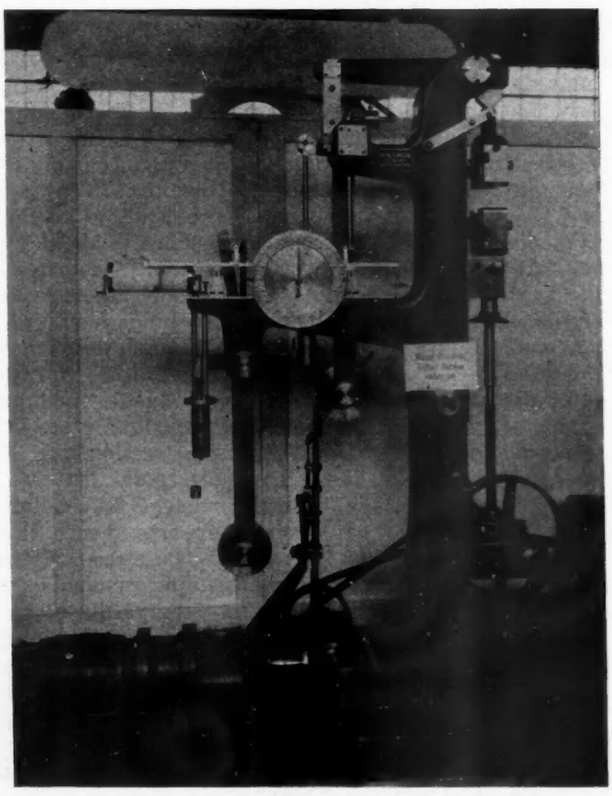
Dial indications are proportional to the loads. An accuracy of plus or minus 1 per cent is guaranteed from 10 per cent of the capacity of each range on, the ranges ordinarily being 1/10, 1/5, ½ and 1/1 capacity. The actual accuracy is said to be even higher. A maximum hand, which indicates the greatest load reached in a test, is also provided for.

The machines are ordinarily equipped with a stress-strain recorder, which is not shown in the photo.

The machine is equipped with wedge grips for flat and round specimens. If desired, threaded specimen holders can be furnished, as well as gripping fixtures for special purposes. The grips shown in the photos are especially designed for tests on wood, in that centering devices acting in two directions are provided for.

In transverse tests, the upper crosshead takes the loading tool, while the lower crosshead carries the supporting beam with 36 in. maximum span. A similar arrangement is used in Brinell and buckling tests.

The net weight of the machine is 450 lb.



Motor-driven Wazau testing machine

JUST AMONG OURSELVES

In 1936— "Chapin for President"?

POLITICS is taboo in these columns, and we aren't going to inject any now. Can't help letting our imagination run a little, however, when the wish becomes daddy to our thoughts.

An automotive executive has been Ambassador to Poland, Governor of Massachusetts, Assistant Secretary of Commerce, and now Secretary of Commerce —a member of the President's Cabinet. With due respect to all of his predecessors, the present Secretary of Commerce is generally believed by those who know his past achievements to be the peer of any and the superior of most of those who have preceded him in this high office.

Now let's suppose Mr. Hoover should be reelected this fall. Then let's suppose he reappointed the present secretary, and Mr. Chapin had four long years in which to perform for the public-at-large the same fine services he has been rendering to the automotive industry for thirty years.

Isn't it within the realm of reason that in 1936 or 1940 successful support might be ranged around banners bearing the legend, "Chapin for President"?

Thirty per cent of all of our Presidents were Cabinet officers before being elected to the presidency.

Big Distributor Exit Continues

HUPMOBILE recently appointed five distributors in New York City, a territory which had previously been handled by a single distributor. There is little left of the vast array of big-territory, big-profit distributors who once were the backbone of automobile distribution in the United States. The Hupmobile move is merely one of the last of the many guns which have been fired over the grave of large-territory distribution in the last 10 years.

Territory Not Entire Story

First, the lowest priced cars went to direct dealerships, then the cars in the next price bracket, and then, several years ago, even the middle-priced group began moving toward small territories for distributors. The distributor in most of these instances today has a territory about equal to that of a fair-sized dealer in the old days. Only a few companies are left, and those chiefly in the high-priced field, which adhere strenuously to the old-fashioned type of distributor set-up. Perhaps all will be gone within the next decade—but perhaps not.

Territory of course is not the whole story as regards either the sales total or the profit possibilities for an individual selling company. The relation of capital invested to territorial possibilities is not sufficiently considered in many dealer or distributor appointments. But territories must be large enough to yield a profit to the *average* distributor or the trend inevitably will have to be back toward larger territories—or factory branches. We have yet to find a factory which really likes to open branches.

"De Lawd" Gives Two Good Reasons

BEHIND the times, as usual, we read only last week-end for the first time Roark Bradford's "Ol' Man Adam and His Chillun," the book of negro-interpreted Bible stories from which the now-famous play, "Green Pastures," was taken. Previously we had avoided it, because, somehow or other, we thought we wouldn't care for it.

But not now! We recommend it to old and young, rich and poor, serious-minded and frivolous-minded, executives and employees, without reserve. It's wonderful, incidentally, for reading out loud.

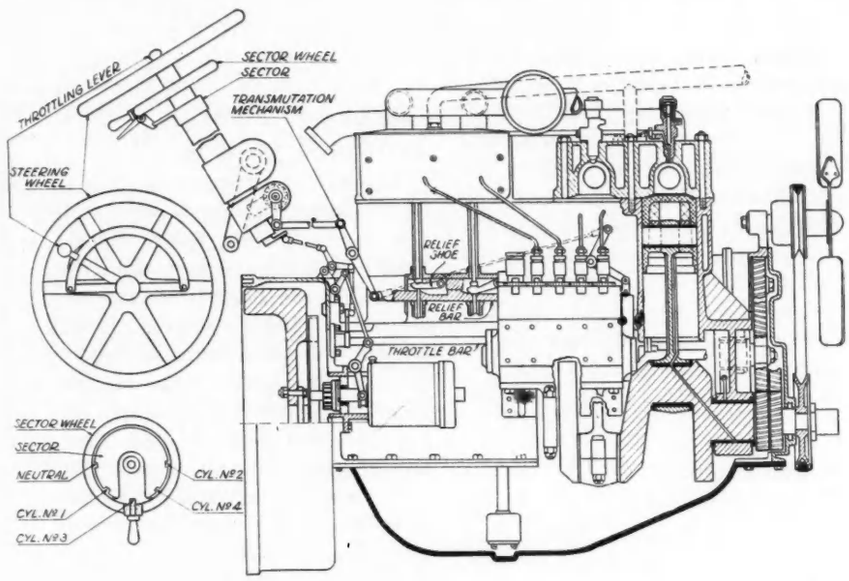
Reason Enough?

Plenty of automotive men, when questioned about their reasons for taking or failing to take action, we guess, would like to be able to reply as the Good Lawd did to Joshua, when the latter questioned him as to why the Children of Israel had to fight constantly to keep the Promised Land after it had been given to them.

Says Joshua: "Why don't you go on and pass a miracle and drive de enemies away widout mo' fightin'?"

"Joshua," say de Lawd, "hit's jest two reasons which I ain't gonter drive de enemies out by a miracle. De fust one is: I don't want to. And de next one is: I ain't goin' to."—N. G. S.

Compression Mechanism Facilitates Starting of Diesel Powerplants



Pokorney fuel-injection pump with means for preventing pumping action while cranking the engine and for varying the effective pump stroke for engine control

A DECOMPRESSION mechanism which facilitates starting is the special feature of an automotive-type Diesel engine designed by Henry Pokorney of Rome, N. Y. The engine is of the four-cylinder type and has its valves arranged in the head, inlet and exhaust valves being coaxial and at right angles to the cylinder axis. This valve arrangement, which is widely used in England for Diesel engines, has the advantage that it permits of the use of valves of large diameter, thereby increasing the volumetric efficiency, and that it gives such a form of combustion chamber and permits such a location of the injection nozzle that there is little likelihood of the spray striking the metal and becoming chilled. The air valve is provided with a cage, which makes it possible to regrind the exhaust valve (and the inlet as well, should that be required) without taking the cylinder head off.

Starting is effected by means of an electric starter, which engages a gear ring on the flywheel through a toothed pinion. To make it easier for the starter to crank the engine over, provisions are made whereby all of the inlet valves can be held off their seats while the engine is being cranked, so that no compression can take place in the cylinders. To further reduce the starting torque required, all of the fuel pump plungers are lifted to a neutral position, so that they cannot be raised by the cams on the pump shaft, and no fuel will be injected while the engine is being brought up to speed by the starter.

After the engine has attained sufficient speed so that it will be carried over compression by the inertia of its rotating parts, the driving relation between the valve plunger and the valve of one cylinder is reestablished, so that compression can take place in that cylinder, and thereafter the driving relation between cam plungers and valves is reestablished in the different cylinders successively.

For the purpose of lifting the inlet valves off their seats, a relief bar is provided which extends lengthwise through the engine, adjacent to the valve plungers and valve-lifter rods. This relief bar is provided with raised portions which, when the bar is moved longitudinally by the control lever, engage under the rocker levers and raise the valve lift rods. The raised portions are so spaced along the length of the lifter bar that the valves will be lifted one after another and not simultaneously.

When the inlet valves of the engine are lifted off their seats by this decompressing mechanism, it is desirable to also interrupt or prevent actuation of the injection pump, for if injection occurred under these conditions, not only would the fuel injected be wasted, but it would be likely to wash the lubricating oil from the cylinder walls and there would be danger, moreover, of an excessively heavy explosion when the air valve were released and allowed normal compression to occur again. Besides, operation of the pump plungers

by

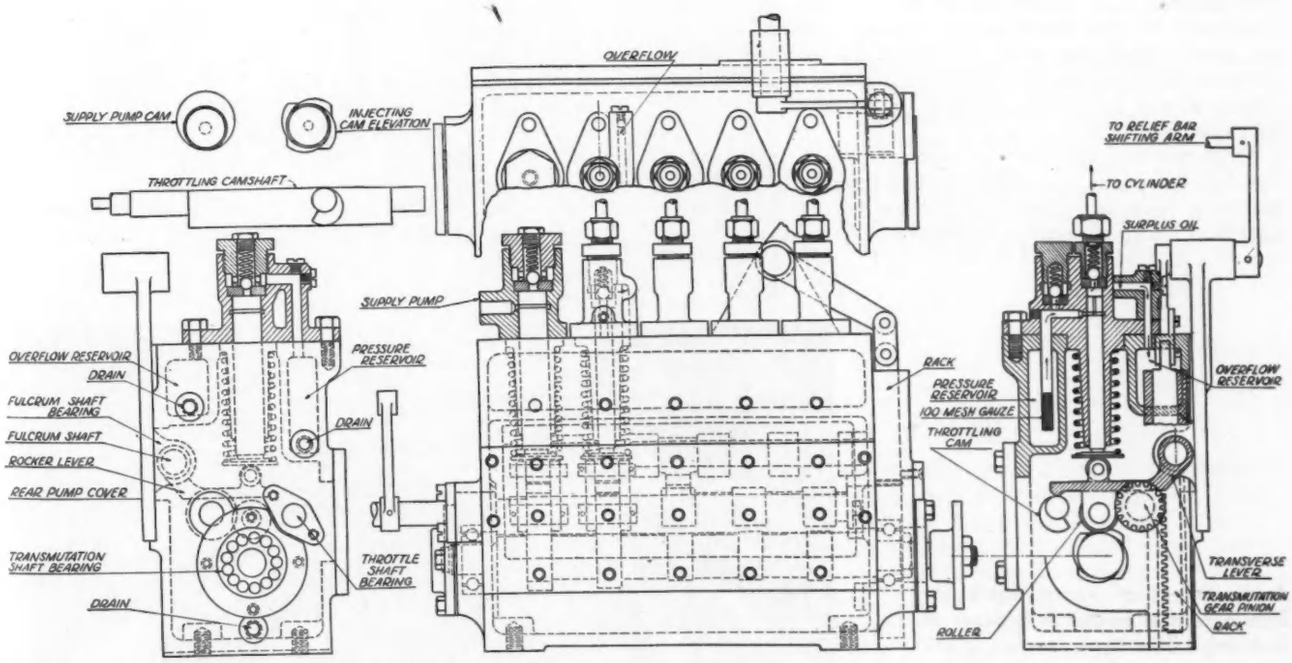
P. M. Heldt

calls for the expenditure of a certain amount of energy, and by preventing it during the cranking period, the power required for cranking is reduced.

A special design of injection pump has been evolved for this engine, which possesses interesting control features. Sectional views of the pump are shown herewith. The pump comprises one low-pressure unit for delivering oil under light pressure from the supply tank to the pump pressure chamber, and four high-pressure units for injecting fuel into the four cylinders of the engine respectively. All pump units are of the usual plunger type. The low-pressure plunger is actuated by means of an eccentric on the pump shaft, which latter extends through the pump housing longitudinally. In addition to the eccentric for the low pressure unit, this shaft carries four cams for the operation of the high-pressure units.

Motion is transmitted from the cams on the pump shaft to the pump plungers through the intermediary of rocker levers which are mounted on a fulcrum shaft. Each of these rocker levers carries two rollers in line with the pump plunger, one making contact with the cam and the other with the pump plunger. Extending lengthwise through the pump housing are two control shafts, one referred to as the throttle shaft and the other as the transmutation shaft. Both of these shafts carry cams adapted to hold the rocker levers in a more or less raised position. The throttle shaft is under the free end of the rocker levers. As this shaft is rotated around its axis, the cam lobes on it are swung into positions where they prevent the rocker levers to fully return to their lowest position. The result of this is that the plunger stroke is reduced and less fuel is injected into the engine cylinders. All of the cams on the throttle shaft are in phase angularly, so that the strokes of all plungers are increased and decreased equally.

The transmutation shaft on the opposite side of the pump housing is operated from the same control lever on the steering post as the intake-valve relief bar, through a linkage connecting to a bellcrank on the pump housing. From the bellcrank there is link connection to a vertical rack in one end of the pump housing, the rack meshing with a spur pinion on the end of the transmutation shaft. This shaft carries a number of cam lobes, one for each high-pressure unit, by means of which the respective rocker levers can be raised to their highest position. The cam inclines are spaced angularly, so that one rocker lever is raised after another, instead of all being raised simultaneously. The order in which the various pump plungers are raised and released is the same as that in which the inlet valves of the corresponding engine cylinders are raised from their seats and released by the relief bar. Thus fuel is injected only into cylinders in which air is compressed in the usual ratio, assuring ignition of the fuel upon its entry.



Side view of Pokorney engine, partly in section, showing details of decompressing mechanism

Industry Benefited by Vapor, Hygienic Lighting

Modern developments in factory illumination improve visual conditions and promote health, resulting in production economies

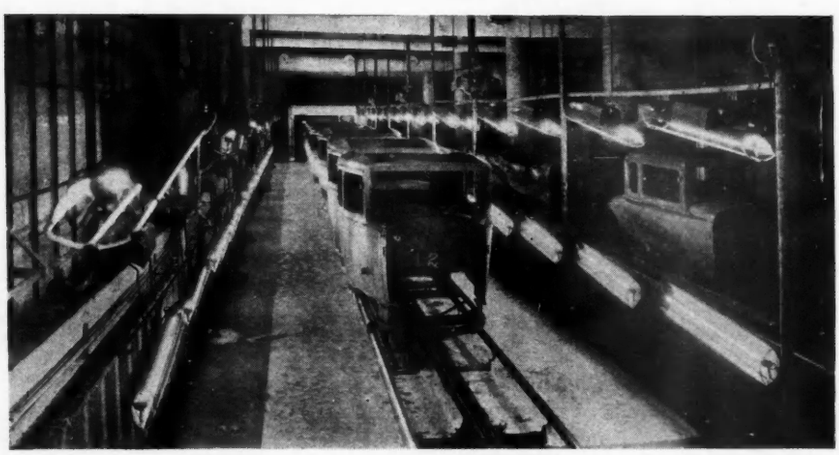
VAPOR and hygienic lighting, among the most recent developments in the field of artificial illumination, seem certain to play an increasingly important role in automotive plants in the near future. It is well worth while, therefore, for plant and production executives to acquaint themselves with the advantages which these forms of lighting bring, especially as some rather extravagant claims have been advanced for lighting of these types.

Although many new things are being learned about vapor lighting, it is far from being a new type of illumination and has already seen extensive use in automotive plants. All vapor lights are the result of arcs or electrical discharges through a gas or vapor. The discharge is accompanied by what is termed an electronic bombardment of the molecules which causes the gas to glow and give out light. If an alternating current produces the arc, it flickers and gives a stroboscopic effect, but if the current is rectified or direct, there is no flicker.

High-tension alternating current vapor lights are suitable for signs and other special purposes, but thus far they have not proved useful for industrial illumination. Their current consumption is small, and this has led to claims for exceptional efficiencies. It still remains, however, to produce industrial lighting units of this type that combine the reliability, freedom from flicker, safety and other factors required in industrial installations. But this does *not* apply to the well established low-voltage mercury vapor light which is used so extensively in automotive plants, for it is not only safe and reliable but is entirely free from flicker and possesses other qualities that make it especially useful for industrial illumination.

All vapor lights have distinctive colors which are characteristic of the particular gas employed. Thus, the neon light is orange-red, argon is purple, helium is pink, and mercury is yellow-green. Because of these distinctive colors, articles viewed in these lights look quite different than they do in white light. While this is a disadvantage in some cases, especially when it is necessary to distinguish the "natural" color of articles or surfaces, in other cases it is a decided advantage. It is well known, for example, that fine lines, defects, such as scratches on polished surfaces, and outlines are much sharper and more easily seen in the light of one color than in white light. Again, it is known that yellow-green light gives maximum visual acuity and relative freedom from glare. It is also relatively cool as compared to lights strong in orange and red. These are important factors when best seeing conditions are being sought.

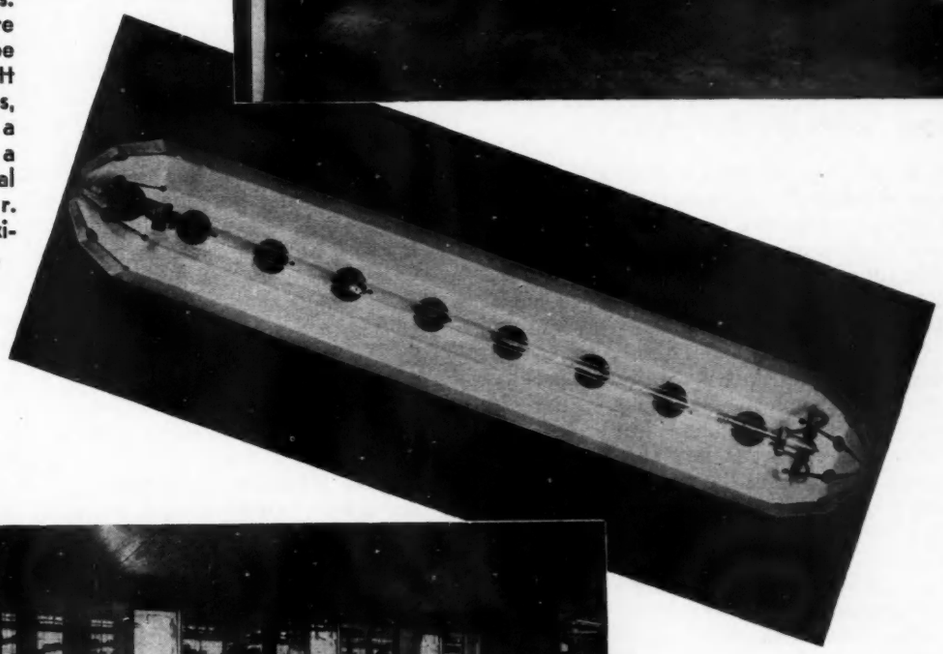
Some vapor lights give off a considerable proportion of ultra-violet radiation, which, being invisible, has

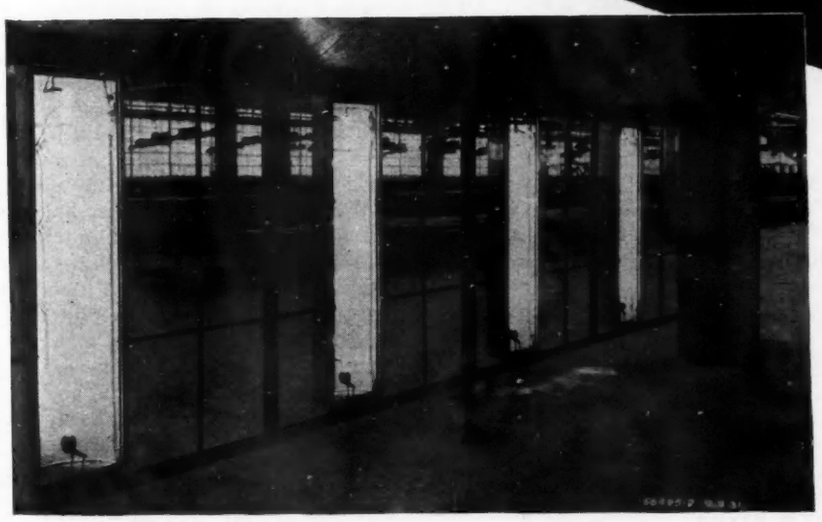


Arrangement of vapor lights for illumination of bodies in process of finishing. This type avoids glare when workmen face some of the lights directly, and the low temperature of the source prevents excessive heat

by
Herbert Chase

Interior of modern spray booth, with glass side walls. Light sources are mercury-vapor tube and four 100-watt incandescent bulbs, inclosed by a ground glass and a semi-cylindrical white reflector. Gives close approximation of daylight, and colors have a natural appearance





Standard combination lighting unit consisting of 450-watt mercury-vapor tube and 8 incandescent bulbs consuming a total of 400 to 800 watts. Intended to give close approximation to daylight where color identification is important

Another form of spray booth with one closed end, showing an alternative arrangement of lighting units combining mercury vapor and incandescent light sources

no effect upon seeing qualities but has been found to have a definite effect upon health. It is the ultra-violet component in sunlight which produces the healthful tan acquired by exposing parts of the body to the summer sun. In winter, in portions of the country where most automotive plants are located, there is very little ultra-violet light in sunshine, because these rays are largely absorbed by the atmosphere when sunlight passes through it at winter angles. It is possible to reproduce June sunlight conditions, however, so far as ultra-violet light is concerned, by the use of vapor lights, and precisely this is done with the modern hygienic light for industrial applications.

One advantage of the mercury type of vapor lighting is that it gives off considerable ultra-violet radiation. If ordinary lead glass is used for the tube in this type of lamp, only a small part of the ultra-violet passes through the glass But, by the use of a special

glass, enough of the ultra-violet rays come through to make the light equivalent in this respect to June sunlight. Tubes of this type have recently been made available, and their use in a standard mercury vapor lamp enables factory hands who work under such light to benefit by the ultra-violet rays to the same extent as they would by working out of doors in June sunshine. Consequently, any plant now equipped with mercury vapor lights can easily and quickly convert its lighting system, by merely changing tubes, to give hygienic lighting along with the benefits of ordinary mercury light.

How far-reaching are the benefits of hygienic lighting? It is known, as a result of a long series of tests conducted at Cornell University, that those who expose themselves regularly to light having a proper proportion of ultra-violet in its make-up appear to have had their susceptibility to colds reduced by about 50 per cent.

Mercury Vapor Generally Available

Thus far it is only the mercury-vapor type of light which has been developed for vapor lighting in factories, and it is only this type, when fitted with tubes of special glass, that is now available for general hygienic industrial illumination.

In addition to the factors already mentioned, vapor lighting yields other advantages, as well as some disadvantages. One consideration is highly important, especially under some conditions more or less peculiar to certain automotive applications, namely, the size of the light source. To give adequate light from a single unit that is commercially feasible, the source must have considerable bulk, for it is much less brilliant than an incandescent filament. This brings the disadvantage of a less compact unit, but it has two advantages which the smaller brilliant source does not possess: being extended rather than concentrated, the light shines around all but very large objects and so tends to eliminate dark shadows. Being less brilliant, the source can be placed within the line of vision and still not produce glare. Along car finishing and assembly lines this is of considerable importance, for it is necessary, in order to get good light on the sides of the car and body, to hang the units quite low where they shine directly into the eyes of workmen facing them. If the source were glaring, this arrangement would interfere with good vision, but with the low-intensity vapor source glare is avoided and good vision results.

Another factor in favor of the vapor source is its low temperature and the consequent low emission of radiant heat. This makes it possible to hang the lamp quite low, as along the assembly lines, and still not cause the discomfort from heat which sources having high temperatures would entail. It also permits of high average lighting intensities even in rooms with relatively low ceilings which necessitate low hanging of the light sources.

No single light source used in industry today duplicates the white "color" of daylight, hence all colors viewed in these lights appear somewhat different than in daylight. Incandescent lights are rich in red and orange and deficient in blue. Mercury vapor lights are rich in yellow-green and have considerable components of blue and violet but lack red and orange. A combination of the two types of source includes all the colors in daylight and gives a close approximation to daylight. Such a combination is employed, therefore, in some automotive and in other applications where work with colors that should appear natural is involved.

This applies particularly to some spray-painting booths where finishes of different color are applied. One prominent automobile manufacturer who has an installation of this type puts both the mercury vapor tube and the incandescent lights back of a screen forming a part of the wall of the booth, and depends upon indirect reflecting surfaces to direct the light upon the work. This is not the most efficient way of utilizing the light sources, as more light is required than with arrangements giving direct light, but it gives good results.

Spray Booth is Equipped

Another and still more recent installation is now used in the glass-walled spray booths of another large automobile builder. In this case the conveyor carrying the bodies to be sprayed passes through a tunnel booth about twelve feet wide and some twenty to thirty feet long. The walls of this booth are of clear glass and begin about a foot above the floor. Four lighting units are placed at each side of the booth, six to eight feet apart. The lighting units are covered with ground glass 14 in. wide and 60 in. high, placed flush with the inside of the booth and with its lower edge about a foot above the floor. Each unit contains one 450-watt mercury vapor and four 100-watt incandescent bulbs. Back of these is a white approximately semi-cylindrical reflector which, of course, reflects back through the ground glass most of the lighting falling upon it. All of the light sources also throw direct light through the ground glass, which acts as a diffusing means and reduces any glare that might otherwise handicap spraymen who face lights on the opposite side of the booth. The glass also helps to diffuse the light that falls upon the bodies being sprayed and is reflected back by them. Since the color of the light from these units approximates daylight, lacquer colors are easily identified and look much as they do in daylight.

Use of Voltage Dividers With Cathode-Ray Oscillographs

TO modern investigators of rapidly changing electrical phenomena, the most useful tool is probably the cathode-ray oscillograph. This instrument makes it possible to measure time intervals of a fraction of a millionth of a second. One of its widest applications is the measurement of voltages and their variation with time. It is in this respect that it plays an important rôle in the researches of the automotive ignition laboratory.

Unfortunately, the voltage that can be measured directly with the cathode-ray oscillograph is limited; hence it is necessary to divide the applied voltage and measure only a known fraction of the total voltage. Research at the Bureau of Standards has resulted in the development of a capacitance voltage divider, suitable for a wide variety of uses. This divider will be described in Research Paper No. 460, Voltage Dividers for Use With Cathode-Ray Oscillograph, which was published in the July number of the Bureau of Standards *Journal of Research*.

PRODUCTION LINES

Production lines of the industry No. 16

Chrysler camshafts coming out of the carburizing furnace after soaking for 13 hours. Note the mechanical hand that facilitates the discharging operation

Metal Edged

Business literature on technical products is becoming more and more attractive. For a good example we refer you to the packaging portfolio just issued by the National Metal Edge Box Co. It tells the story of the "strongest paper box known." Presentation and product should prove of interest to many.

Winning Combination

Interested in new data on transmission belting and industrial rubber goods? You'll find it in a recent catalog by B. F. Goodrich—"Engineering Data, Industrial Rubber Goods." Among other things, this guide boasts several engineering tables which are claimed to be absolutely new. One on transmission belting gives horsepower capacities, minimum pulley diameters, leather belt equivalents, etc. Another, on conveyor belts, permits the selection of belting for any conditions without resort to formulas or other calculations.

Protects Lumber

According to the *Bakelite Review* for July, 1932, the following is a good protective coating for mill priming lumber: long oil varnish formulated with Bakelite synthetic resin mixed well with flake aluminum. The flakes float in the vehicle and cover the surface as the film dries.

Cold Magic

One of the first air-conditioning organizations in the country tells the world about itself in a book distinguished by its typography and illustrations. "Cold Magic" will give you some valuable information concerning air conditioning. In the automotive industry air conditioning may be applied profitably in factory buildings, cold rooms, master inspection rooms, etc. Get a copy of this book from the York Ice Machinery Corp.

Production Men

This is your page.

Any suggestions you have on new methods or kinks may be of value to men in other factories.

If you are working on some new development, we'd like to know about it—even if not for publication with your company's name.

Personnel Matter

Fitting the man to the job is no mean undertaking. Mixing science and art, the National Institute of Industrial Psychology of London invites industry to submit its personnel problems for some rational solution. As a beginning they have set up a research laboratory with some very simple apparatus. Quoting the *N. Y. Times* correspondent:

> "If the employer wanted a motor or airplane mechanic, here was a battered rat cage made of twisted wire, at the most intricate point of which a small key was looped. You had to manipulate the key as quickly as possible from one end of the cage to another, in order to prove that you would be both patient and dexterous when repairing the inaccessible parts of machines.
>
> "If motor-coach drivers or chauffeurs were asked for, here was a board with winding parallel lines sprawling across it. By pulling a lever attached to a spring you could make a pencil move up and down the board. But all your skill and concentration were required to keep the pencil drawing neatly between the parallel lines—in other words, to keep your car from going into the ditch."

There's just no end to human ingenuity.

Andiroba and Castanheira

—two of the rare woods found on the Ford rubber plantation in Brazil. A recent shipment to Dearborn included some fourteen varieties of rare trees. These will be converted into burl veneers for the interior moldings of Lincolns. If you don't know it, the latest Lincolns have decorative moldings fashioned of Honduras mahogany with a veneer of Carpathian elm burl. From now on the Brazil veneers off Ford plantations will replace the imported woods. *Ford News* for August, 1932, says so.

Good Work

Rouge plant apprentice school free to Ford employees will reopen in September. Elementary science and engineering courses are offered, thus continuing the good work which characterizes the large automotive enterprises.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

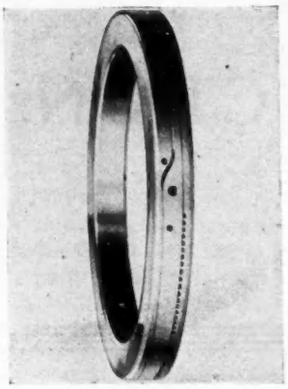


Fig. 1—Assembled Wyromatick compensator for roller, ball and thrust bearings

Use of smaller bearings is made possible by new device being produced by Federal-Mogul, designed to insure proper adjustment within 0.00025 in.

Wyromatick Compensator Controls

by Athel F. Denham

MANUFACTURING and sales rights for the Wyromatick compensator, developed by the Wyrick Engineering Corp., of Wyandotte, Mich., have been acquired by the Federal-Mogul Corp. of Detroit.

The compensator, as it is now offered by Federal-Mogul, incorporates a number of improvements, most important of which is the ability to provide a controlled predetermined amount of preloading of the bearing, insuring that any clearance necessary to allow for expansion or contraction is controlled within the compensator, and not in the bearing.

As originally developed, the compensator was a device purely for the purpose of constant automatic maintenance of bearing adjustment. It is claimed that automatic adjustment can be held within 0.00025 in., whether in a plain sleeve or a ball or roller type of bearing.

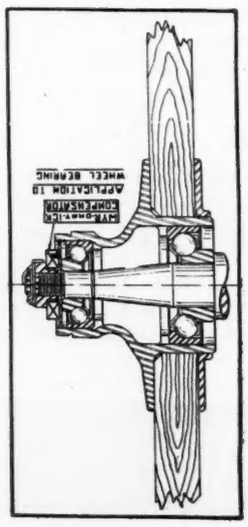


Fig. 4—Wyromatick compensator as applied, for instance, to wheel bearings

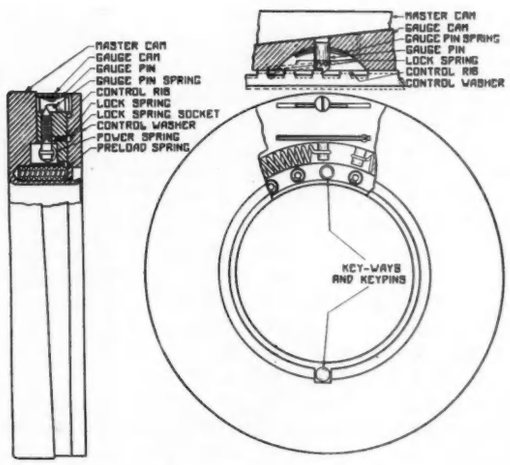


Fig. 3 (right) — Sections through Wyromatick compensator, showing various parts and their relation to each other. Note that control washer and master cam have no relative motion, being locked together by keyways and key pins

A claim made for the compensator is that it frequently enables the use of a smaller bearing, since the preload insures good load distribution as opposed to the possibility of concentrated loading in a bearing in which clearance has to be provided or in which it has developed as a result of wear.

The compensator now being offered consists of three major parts, shown in Fig. 2, the master cam, the gage cam, and the control washer. The two cams have mating helical faces which will increase their joint cross-section when the two cams are rotated in opposite directions. A coiled "power" spring between the two cams tends to produce such relative motion as the bearing wears. The control washer serves to control this motion.

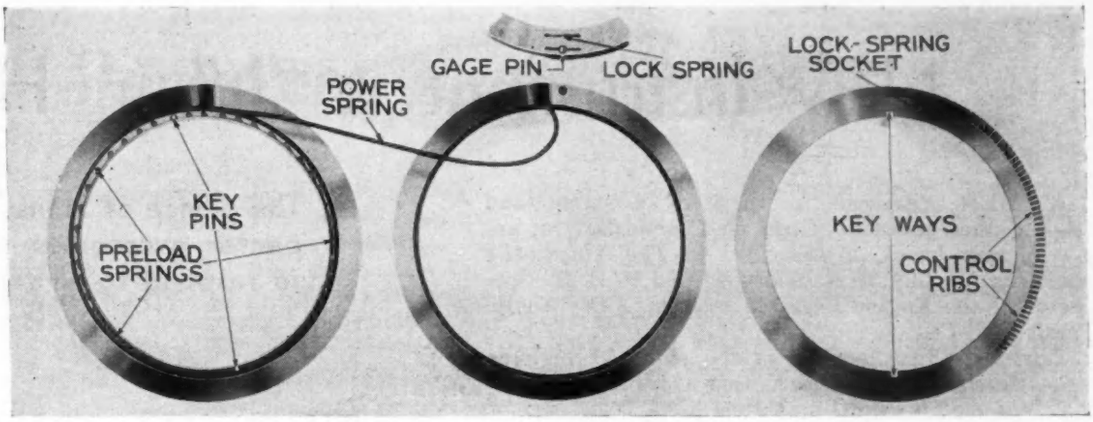


Fig. 2—Photo of the three major parts disassembled

Bearing Preloading

Between the master cam and the control washer, and passing through inside the gage cam ring, are located the preload springs, which also take up expansion clearance in the bearing and compensator installation.

When the compensator is assembled, it is wound and held in the wound position by a lock spring on the gage cam which engages in a lock spring socket on the control washer. When it is drawn up in a bearing assembly, the pressure releases the lock spring. Thereafter this spring performs the function of establishing any clearance which may exist in the compensator assembly, between the gage cam and the control washer rather than between the cammed members.

Relative motion of the cammed members is prevented also by a gage pin, a spring-mounted plug in the gage cam which engages serrations in the control washer.

To follow the action better, let us assume that it is desired to take up clearance in a bearing in increments of 0.001 in. It will be remembered that the preload springs are continually urging separation between the master cam and the control washer, and that the lock spring is locating such separation between the gage cam and the control washer.

When 0.001 in. of wear has occurred in the bearing, the gage pin passes one rib on the control washer; that much relative rotation between the master and gage cams increases their joint cross-section exactly 0.001 in. There can be no further motion until another 0.001 in. of wear has occurred.

For any intermediate wear conditions the preload springs take up the clearance, so that the bearing should always be in adjustment, and under a definite preload within narrow limits.

It will be readily seen that the compensator acts on the principle of the go and no-go gage, the gage cam and the gage pin doing the measuring (distance of the gage pin end from the inner face of the control washer), and the control washer serving as a means for readjusting the measuring device.

Fiat Diesel Aero Engine

NEXT year the Technical-Commercial Office of the Aircraft Department of Fiat, Turin, Italy, will bring out a stock model of its Diesel aircraft engine to be known as the A.N.2. This will be similar to the A.N.1, the experimental model briefly described in *Automotive Industries* of July 12, 1930, with such improvements as have been suggested by experience with the last-mentioned model on the test stand and in the air.

It may be recalled that the A.N.1 in turn was a development of the company's standard spark-ignition aircraft engine, the A.12 bis, the crankcase, crank train, auxiliary drives, etc., being exactly the same, while the cylinder bore was reduced to prevent an increase in the load on the crankshaft bearings.

Fuel is injected by two Bosch three-element pumps, mounted in the positions occupied by the magnetos in the spark-ignition engines. Both pumps are hand controlled by two linkages, one for timing, and the other for varying the amount of fuel injected per cycle. In spite of the fact that the new engine is an adaptation of an existing design, it is compact and of neat appearance, and the specific weight is said to be sufficiently low to make the performance remarkably good. Following are the principal specifications of the A.N.1 engine:

Type	6-cylinder in line, water-cooled engine, operating on the Diesel cycle.
Bore and stroke	5.51 x 7.09 in.
Piston displacement	1014.7 cu. in.
Compression ratio	14
Maximum mean effective pressure	86.6 lb. p. sq. in.
Maximum torque at propeller	579 lb.-ft.
Normal output, rated	180 b.hp.
For cruising	162 hp.
Corresponding propeller speed	1500 r.p.m.
Maximum output in standard air, ground level	220 b.hp.
At 16,000 ft.	96 hp.
Corresponding propeller speed	1700 r.p.m.
Consumption at rated hp., fuel	0.485 lb. p. hp.-hr.
Oil	0.033 lb. p. hp.-hr.
Over-all dimensions, length	71.7 in.
Width	26.4 in.
Height	48 in.
Weight of engine, complete with propeller hub, fuel pumps and starter, dry	884 lb.
With water, fuel and oil in the engine	918 lb.

New Instrument is "It" in Hide and S

The device of Stansfield and Carpenter overcomes the tendency to respond to all sounds within a cycle

A NEW instrument for the study of engine (and other periodic) noises, and particularly of engine knock, is described in *The Automobile Engineer* for July by R. Stansfield and R. E. H. Carpenter of the Engine Research Branch of the Anglo-Persian Oil Co.

This instrument applies in the study of periodic noises a principle analogous to that of the stroboscope; that is to say, it selects on a time basis, some part of a recurrent noise to be investigated. The need for an instrument of this kind was shown by some experiments on three engines with what is referred to as a phonometer, that is, an instrument that will pick up sounds, convert the sound energy into electrical energy, "amplify" the electrical energy and measure it. A good carbon microphone was used as a receiver, and combined with a valve which included a tunable-frequency selective voltmeter. With this equipment the entire sound spectrum from about 200 to about 10,000 cycles per second was explored.

A curve of sound intensity vs. frequency was plotted for each engine in the smooth-running condition, and then for each in the knocking condition. A series of peaks, generally descending in height with increase in frequency, was found to exist for both types of running, no new peak being introduced by the change from smooth to knocking operation.

Two of the engines showed the greatest change of sound in the region of 2000-2500 cycles per second, while the third showed the most marked change at only 800 cycles per second, although to the ear a much higher note knock sound had developed in the latter case than in the two former.

In addition to the peak values most affected, all other peaks on the "smooth-running" curve had increased in height when knock developed, showing that detonation was affecting the entire sound spectrum. It was found that a decrease of four in the octane number of the fuel increased the heights of the various peaks by from 5 to 10 per cent.

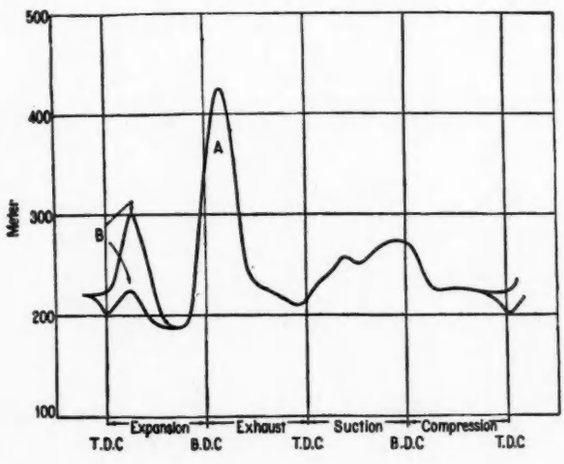


Fig. 1—Noise cycle of single-cylinder engine, with open exhaust, run on two different fuels. A, exhaust; B, combustion knock

From these results it became apparent that the failure of the phonometer to respond to the audible increase in the higher frequencies was due to the fact that the meter averaged the sound over the whole period of the cycle, whereas the ear and brain were able to apply selective attention to the isolated recurrent pinking sounds.

The disadvantage of the usual electrical noise-measuring instruments is that they readily respond to any other sounds in the cycle and sounds from other sources in the vicinity of the engine. This makes high accuracy impossible, and it was to overcome this difficulty that the strobophonometer was devised.

In describing their device, Messrs. Stansfield and Carpenter say that for the majority of applications a simple telephone ear-piece is highly satisfactory as a microphone. When this is held in a sponge-rubber mounting against the source of sound, the diaphragm is damped by the air pocket formed between the machine, the rubber and the diaphragm housing.

This damping is sufficient to give the necessary frequency range, and the range may easily be changed when required. The selection of high frequencies only does not appear to be of value in most cases. If necessary, diaphragms of various thicknesses held near to the machine, but not inclosed to give air damping, may be substituted, but after extensive test with microphones of varying excellence, the authors found it of advantage to depart from the simple ear-piece with a thin diaphragm to one of heavier gage only in the case of multi-cylinder engines.

Operation of the amplifier from any of the usual alternating current supplies is evidently the simplest for general use. The complete apparatus for a.c. use includes a microphone, an amplifier, an output meter and control box and a selector. The latter is driven from the machine under examination and is provided with a direct and a 2-to-1 drive, so that it can be used on four-cycle engines coupled either to the camshaft or the crankshaft. Two knurled nuts on the sector release the brush gear controlling the listening angle and the phasing, and allow either of these to be adjusted.

It is obvious that the introduction of the selecting mechanism greatly increases the field of usefulness compared with any sound-measuring apparatus which is arranged only to listen to the entire cycle of sound, or only to a given frequency range. Consider the simple case of a noisy pair of gears.

The noise may be due to the teeth being generally too deep in mesh, or it may be a varying noise due to one of the shafts or wheels running eccentrically. The simple form of phonometer registers the mean noise in each case, and cannot distinguish between the two

Seek of Recurrent Engine Knocks

types. The present apparatus, on the other hand, may be used to determine the relative total noises from a series of gear assemblies used without the selector.

It may be used in conjunction with the selector to determine whether noise from an assembly is constant throughout a revolution of any shaft, or whether it varies with the angle turned through on account of eccentricity. It also locates a sound caused by a single bad tooth.

For the latter purposes the selector is coupled to a suitable shaft and set so that the listening angle is, say, 30 deg., and this period is then phased round the cycle. If the noise is steady the output meter reading will remain constant. If it varies, due to eccentricity, then the reading will alter steadily between a minimum and a maximum, or a series of maxima and minima.

In the case of knock noises from engines it is possible to compare combustion sounds with other mechanical noises, and so to determine the relative importance of each in making up the total running noise. One such examination of a single-cylinder high-speed Diesel engine showed that the noise from overhead-valve gear was much more serious than the combustion shock on an average fuel.

In a second example the combustion shock was more pronounced than any other sound. The total sound level from the two engines was roughly the same.

Fig. 1 herewith is a diagram of the noise cycle obtained with this instrument from an Armstrong single-cylinder engine running at 750 r.p.m., the engine being run without exhaust pipe, so that to the ear nothing but the bark of the exhaust was audible, and with two different fuels with a difference of four in their octane numbers. It will be seen that the effect of change of fuel is noticeable only when the listening period occurs during the expansion stroke.

Brockway Brings Forth New School Buses

BROCKWAY MOTOR TRUCK CORP., Cortland, N. Y., has just announced a new line of school buses including five different chassis designs. Each of these chassis models can be provided with a body having one or another of three seating arrangements.

In the first type of body there are four longitudinal benches, one along each side of the body and two back to back in the center.

In the second there are two benches along the sides and a row of seats down the middle, while in the third there are the customary two rows of seats on the sides, with a center aisle between.

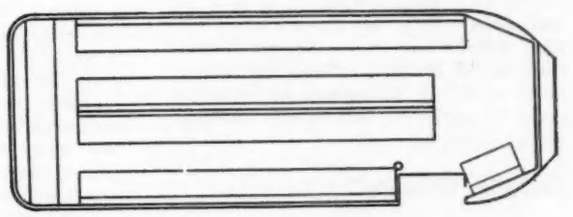
Each body, in addition to the seating arrangements mentioned, has a full-width cross seat at the rear and a seat along the wall in front, at the side of the entrance.

The first arrangement gives the greatest seating capacity for a body of given length. For instance, in the case of the longest chassis, which has a wheelbase of 240 in., 73 passengers can be carried with the first arrangement of seats, 57 with the second, and 54 with the third. The accommodations evidently are not quite as comfortable with the first arrangement as with the third, but in view of the fact that the average ride in a school bus is relatively short, this would seem to be not a matter of great moment.

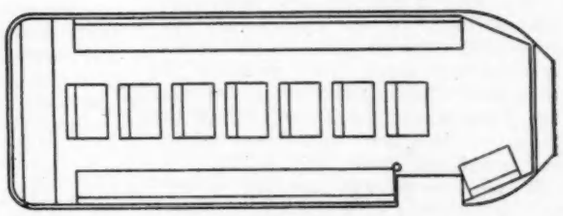
Principal chassis dimensions of the four bus chassis are combined in the following table:

Chassis Model	Wheelbase	Engine Dimensions	Piston Displacement	Chassis Weight
A-SB	168	6-3⅜ x 4⅝	248	4,240
B-SB	186	6-3⅜ x 4⅝	248	4,760
C-SB	188	6-4 x 4⅛	311	6,200
D-SB	212	6-4 x 4⅛	311	6,790
E-SB	240	6-4⅛ x 4¾	381	7,950

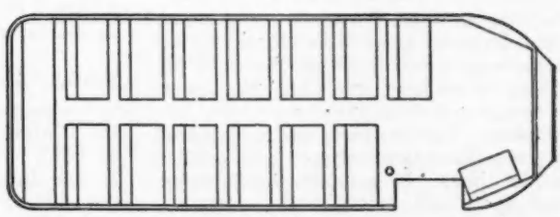
The seating capacities range from 30 to 38 in the Model A-SB, from 36 to 50 in the Models B-SB and C-SB, from 48 to 62 in Model D-SB and from 54 to 73 in Model D-SB.



Model 9421

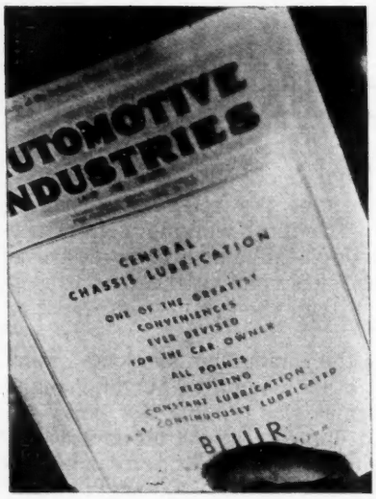


Model 9421-A



Model 9421-B

Plan showing optional seat arrangements of new Brockway buses



Asks Stricter Driver Exams

EDITOR, *Automotive Industries:*

I have been holding your paper of July 23 on my desk open to the page showing the "Gun Man" which is, in the opinion of many good "Connecticut Yankees," an unhappy combination with the name of Robbins Stoeckel.

Mr. Stoeckel is one of those all too few public officials who is utterly independent in action, decides matters on his own judgment and, to mix the metaphor, "lets the chips fall where they may," but there is considerable that could be said about his article here in *A. I.*, somewhat in rebuttal, more in criticism, but mostly in additional suggestions.

Simile is "Unhappy"

In rebuttal I would offer that the simile of a man with a car to the "thug with a gat" is most unhappy. The majority of the citizens are respectable. The majority of car drivers are not using their vehicles as weapons. The majority of car drivers are, furthermore, left pretty much to their own judgment as to what might be considered "safe driving."

I can show you several cities, through which I have traveled in Connecticut, with the street signs calling for twenty miles an hour and perhaps five cars out of a hundred are running as slow as that. I can show you highway lanes outside of the city with the maximum speed listed on the signs of 35 miles an hour and about the same average adhering to the dictates of the law. This is due to the impossibility of police supervision over all points at all times. In general, the dangerous spots are pretty well protected. Mr. Stoeckel, however, is somewhat sweeping in his suggestion that 45 miles an hour would be a maximum speed limit. Certainly not in the State of Michigan, from my general observation in touring that part of the country.

As criticism, I would suggest that a more complete examination of drivers, before granting licenses, and a more complete inspection of cars as to their road worthiness, would assist a great deal in making the roads safe.

Suggests Rail Practice

I remember mentioning to you some years ago the fact that railroads particularly, among the public carriers, are subjected to a very severe supervision and inspection of equipment and roadbeds with high standards consistently maintained. I feel sure that this same principle, at least in some degree, should apply to cars on the road. The automobile builder ought to welcome it too for the simple reason that disqualifying a car on its condition ought to assist considerably in settling a large part of his used car problem.

Most car designers will agree, also, that it is going to be difficult to hang another gadget, in the way of a governor, on to cars to limit their speeds. My suggestion would be to control through valve areas the flow of gases, which means a redesign of the engines to obtain all the power available within the speed range permitted, but to restrict the higher passage of gas as required for higher speeds. However, this should be one of the last steps taken.

My suggestions, therefore, would comprise a stricter examination of drivers, the installation of instructions to poor drivers, similar to that run in the State of Michigan, particularly in Detroit, a closer check on cars and their condition, and the posting of reasonable speed rates through closer cooperation of city and town authorities with the State Motor Vehicle Commission so that ridiculously low rates will not be posted where they cannot be reenforced.

It's only fair to state finally that I thoroughly agree with him that the psychology of "speed advertising" has been bad, for unreasonable speed mania is distinctly bad.

E. P. BLANCHARD,
The Bullard Co.
Bridgeport, Conn.

Variable Injector Has Design Hurdle

EDITOR, *Automotive Industries:*

Looking over E. B. Neil's report on the National Oil Power Conference at Penn State, in your issue of July 2, the diagram on page 12 inspires some thoughts.

Mr. Dickinson's suggestion "to get the stuff ignited before the rest gets in," is a good slogan for further high-speed Diesel developments. To inject a small quantity of fuel during the early part of the injection period in the neighborhood of a hot spot inside the combustion chamber seems to be a possible solution of the problem. It has been demonstrated several times that the finer the spray is, the smoother is combustion (the less rapid the pressure rise). In a variable-speed Diesel engine, such as a bus engine, it is thus imperative that the first part of the spray should be exceedingly fine at all speeds down to idling; the rate of injection as a consequence must increase at an increasing rate so that the injection can be finished at T.D.C. at maximum rated load. However, such a fine spray requires a combustion chamber in which a directed air swirl takes care of the mixing of fuel and air, and carries the fuel away from the nozzle. If on top of this an easy, cold start, without the help of heating plugs, could be obtained through one long, free fuel spray, we would have a practical engine.

One of the most difficult things will be to so design the injection pump that it will give the proper injection sequence. A cam-operated pump may be designed to give a progressive rate of injection, but at low engine speeds the rate during the first portion of the injection period will be slow, which results in a coarse spray, slow to ignite.

Therefore, the thought occurs that the first small part of the fuel charge should be injected at a high rate, independent of engine speed, while the rest of the fuel may be injected in proportion to engine speed.

A pump combining the spring-loaded injection system with the ordinary cam-operated system might do the trick. A cut-off sleeve and a plunger-compressed spring would give a proper injection start. The final injection then would be a function of the engine speed.

HUGO K. MOREN,
Ostersund, Sweden.

Another Advocate Of Strict Tests

EDITOR, *Automotive Industries:*

The July 23 issue of *Automotive Industries* devotes much space to the views of one of the Eastern motor vehicle administrators regarding the speed of automobiles. As was to be expected he hints at more laws and

Forum

regulations, more authority for officials of his type, and therefore more and higher salaries and greater expenses to bear down on the shoulders of the already grossly overburdened taxpayers.

"MY automotive experience," says Mr. Francis, writer of this letter, "began with a one-lung Cadillac in 1903 (and a bicycle before that), and has included many makes of automobiles and motorcycles, factory experience with two of the oldest and highest quality motor car manufacturers in the United States, airplane factory experience, and employment in the aviation field at present.

"I graduated from the tyro class in the days when some of those who now have the loudest voices advocating more motor vehicle regulation were still riding in trolley cars.

"I have not yet been before a court or been arrested, nor have I been in a serious accident, with one exception—a tree was blown down and fell on my car, demolishing the rear of it, while I was driving during a thunderstorm.

"By the use of a little common sense, a speed which permits stopping within the clear distance ahead, and also coincides as nearly as possible with the average traveling pace on the road, any driver can do equally well, and, in fact, 95 per cent of the motorists do practically these three things.

"Why then should this large group be continually hounded by more taxes and more bothersome restrictions just because there may be a 5 per cent group which is a source of danger?"

The article sets forth that a speed of 45 m.p.h. is about the safe limit. Perhaps it is in a narrow state like Connecticut. Had the article been written 15 years ago its author would have declared with equal emphasis that 30 m.p.h was the limit. There are a few people with one-horse-shay ideas in this super-balloon-tire age. However, I have seen a stretch in New Mexico which went to the horizon dead straight, not a single crossroad or habitation, just sand and brush, and when I looked back from the greatest distance over which I could see back to the starting point my speedometer showed 20 miles and I had neither passed nor met a car in the whole distance. What sane man thinks there ought to be a law in Connecticut forcing the car owner to gear his car for a top speed of 45 m.p.h. and crippling him every time he leaves that state for one of larger spaces and ideas?

In the article which arouses my wrath, the statement is made that if as many revolvers were placed in the hands of citizens as there are automobiles, immediate action would be taken to control such a situation. Any such comparison is an outrage, an affront to the public, and demonstrates the inability of its author to reason soundly.

There is absolutely no comparison between a revolver and an automobile.

An automobile is a means of transportation for business and pleasure, and has served millions to their everlasting benefit. People are killed by automobiles, but, for example, people are asphyxiated by illuminating gas every little while and we do not find it necessary to ban the use of it.

Since the subject of killing has been brought into the argument, it can be very effectively employed. We have thousands of homicides in this country every year despite laws to prevent them. Since psychology is becoming more and more an exact science, suppose that we pass some legislation establishing suitable examining boards, commissioners, or what have you, along the lines of motor vehicle administrations, if you please, and at the age of 16 give every citizen a thorough psychological examination to make certain that he or she is of sound mind, normal mentality, and has good judgment, and then issue a certificate that he is safe to go at large and not likely to commit murder. Let us provide for a renewal every year, and, of course, a good fee. Then the 5 per cent who cannot pass the examination can be shut up in insane asylums forthwith, and presto, our murders will drop to an insignificant figure. Never mind the expense to the taxpayers, think of the protection they will be getting It will also help to solve the unemployment problem.

PAUL H. FRANCIS
Mechanical Engineer,
Bureau of Aeronautics,
U. S. Navy.

Low-Pressure Tires Point to New Design

EDITOR, *Automotive Industries*:

A much simpler and cheaper two-passenger motor car, made possible by the new large cross section low pressure tire, is proposed. The car has three wheels placed like those of a motorcycle and sidecar, eliminating one wheel. The car follows automobile construction practice as to frame, engine, body and many other parts. It is proposed to use standard 9 in. cross section tires on a 13 in. diameter rim such as are now on the market for light cars with air pressure about 9 lb. per sq. in.

From tests it is known that such tires will prove satisfactory in riding qualities, durability and low cost per mile without the use of chassis springs on a light three-wheel two-passenger car.

All wheel axles are attached to the frame directly without springs, thus eliminatiing springs, shackles, shock absorbers and universal joints. The triangle formed by the wheels has a right angle at the rear left wheel. The front wheel only is used for steering, eliminating many steering parts.

Much greater coefficient of friction is secured by large tires at low pressure. This design eliminates unsprung weight as the entire mechanism floats on air.

The engine is high-speed four-cylinder four-cycle, air or water-cooled, mounted within the front angle. Standard practice is followed throughout the engine, its accessories and clutch, the controls for the driver and the steering gear. A drive line straight at all times is achieved by having springless axle attachment, thereby saving power and wear and allowing simple unlubricated couplings.

The gearset is in unit with the rear axle gears. The master gear and left wheel are on a solid shaft using the same set of bearings. The propeller shaft can be lighter than ordinarily as it transmits engine torque only, unmultiplied by a gearset.

Wheelbase proposed is 112 in. and tread 56 in. standard.

The body lines can be made handsome because of long low chassis lines.

Road performance should equal the low-priced cars. The weight of the loaded car is distributed so that the rear left wheel carries about 45 per cent, the front wheel about 30 per cent and the right wheel about 25 per cent.

The main essential in cushioning a road shock is to cause the body of the car to rise and fall slowly.

Springless axle attachment is not new in motor vehicles, as motorcycles in spite of their small tires and high speed do not have any springs between the frame and the rear wheel.

A three-wheel car must have a low center of gravity. This is achieved in three ways: the springless axle attachment allows the frame to be near the ground; the floor need be distant from the ground only enough for clearance as no mechanism is under it; the light weight allows a small low engine.

Might this be the $300 car foretold in May 28, 1932, *Automotive Industries?*

JOHN E. WHITESIDE
Syracuse, N. Y.

Automotive Oddities—By Pete Keenan

The News Trailer

Write us if you know an oddity

"Those were the days" — The National Museum, Washington, just acquired some old bills of exchange and promissory notes, stamped and long-forgotten examples of philately. The law of 1798 required a stamp tax of $1 for a $100 note, and a $500 note bore a $2 stamp.

Capt. James A. Mollison estimated his trip here cost $65, and with favorable winds should be less for the return. He used 142 gal. of gasoline to cross the Atlantic, and the oil consumption was very little.

Premier Mussolini, already holding four portfolios in his cabinet, plans to merge the ministries of war and navy under the ministry of air, and head the three as Minister of Defense. "The air will be the world's battle-ground of the future!" he shouted in a recent speech to his followers.

Kaye Don, holder of the world's speedboat record of 119.81 m.p.h., flashed his Harmsworth trophy challenger, Miss England III, over Lake St. Clair at an estimated speed of 115 m.p.h. Tuesday in his first test run.

Indianapolis newspapers are agog at the rumored plans of Stutz to buy out and build a small car. So are we, but Stutz executives are noncommittal.

It took the Trenton (N. J.) police chief to "take prohibition out of politics"—at least as far as his bailiwick is concerned. Motor vehicles may not be adorned with the "Repeal" and "Vote Dry" tags in Trenton. Such tags constitute outdoor advertising, and all such is regulated except for political advertising.

Rear Admiral William A. Moffett, chief of naval aeronautics, predicts development of flying boats capable of 3500-mile non-stop flights, and of dirigibles of 9,000,000 cu. ft. gas capacity as accepted means of transoceanic passenger service. Says navy is developing high-speed engine of 1000 hp.

NEWS

Seeks Higher Vehicle Taxes

Alabama Solons Set To Raise Revenue From Cars, Trucks

BIRMINGHAM, ALA., Aug. 24—When the special session of the Alabama assembly convened here last week, called by Governor B. M. Miller to pull the state out of the biggest financial morass of recent years, the automotive industry was set up at once as the target for revenue measures proposed.

Legislators have come prepared to limit trucks on Alabama highways to 12,000 lb., on the technical grounds that present laws are too loose to enforce.

Gov. Miller has asked the legislators to amend the law on gasoline taxes to allow the state to divert any or all of the receipts for state and county expenditures. One bill introduced would provide that one-half of the gasoline tax be used for teachers' pay.

A sales tax, too, looms, with all eyes focused on the automotive industry. Cars, trucks, parts and accessories are included in several committee reports and it is expected some drastic tax measures will be set up before the session adjourns.

City Machine Gets Large Tool Order

TOLEDO, Aug. 24—City Machine & Tool Co. has received a large order for dies and tools from the Willys-Overland Co. as a part of projected expenditures which will total several hundred thousand dollars. Some of the new tools are to be used in the manufacture of the new type slanting windshield.

Amos Lint, president, says production at the company's plant would be stepped up to take care of new orders.

Spain Imports to Show Gain, Belief

MADRID (*Special*)—Although Spain's importation of automobiles has declined since the heavy duties were imposed, the imports in 1932 probably will surpass those of 1931.

During the first five months of 1930 (before the duties were decreed), a total of 4736 automobiles were imported from abroad.

In the like period of 1931 the total dropped to 640; but in the first five months of 1932 the imports have been 1046.

The United States, France, and Italy furnish Spain the bulk of its automobiles.

Jaeger Car Co. Is Incorporated

Light Automobile for Less Than $400 to Be Announced

LANSING, Aug. 24—Incorporation papers have been filed here for the Jaeger Motor Car Co., Inc., of Belleville, Mich., to manufacture and deal in automobiles, parts and accessories. Capital structure 39,000 shares, no par value.

The company is developing a small, light car, intended to sell, it is reported, for under $400.

General Tire Breaks Record

Rubber Company Marks 18% Gain for First Half

AKRON, Aug. 24—The number of tires sold by the General Tire & Rubber Co. in the first six months of this year was the largest in the company's history, William O'Neil, president, announced here.

It was 17.6 per cent greater than in the first half of 1931. Measured in dollars, the sales were less than 1 per cent under the first half of 1931 despite the reduction in prices.

Union Carbide Dividend

NEW YORK, Aug. 24—Union Carbide & Carbon Corp. has declared a dividend of 30 cents, payable October 1 to stock of record September 2. Three month ago a 30c dividend was paid.

Rail Workers Hit Truck Competition

Executives and Employees Organize to Battle "Uncontrolled" Transport

PHILADELPHIA, Aug. 24—Asserting that wage cuts and shorter working hours are due in a large part to uncontrolled competition by trucks and buses, Philadelphia railroad employees last night joined their employers in a fight for equal regulation.

More than 500 employees of the Pennsylvania, Reading and Baltimore & Ohio railroads organized the Railroad Employees and Taxpayers Association of Philadelphia.

The organization will attempt to secure "proper legislation for equalization of regulation and control of all forms of transportation."

Charles C. Kinney, secretary of the Freight Agents Association, was elected chairman of the executive committee.

Speakers at the meeting pointed out the tremendous investment in property and equipment of railroads. They cited the various taxes collected from railways by Federal and state governments, and drew a comparison with the gasoline and motor vehicle taxes paid by trucking and bus operators.

Roy V. Wright, editor of the *Railway Age*, pointed out that expenditures for highways in the past eight years amounted to 19 billion dollars. Of this, he declared, less than 25 per cent was derived from license and gasoline taxes.

Samuel S. Lewis, secretary of highways for Pennsylvania, declared that "business due the railroads should be restored to them."

He said his interest was in the investment of taxpayers of the state in highways.

"These roads were never intended for trucks as big as freight cars," he declared, "and it was never intended they should drive pleasure cars from the road."

National Battery Is $2.34 a Share

CHICAGO, Aug. 24—National Battery Co. reports for year ended June 30, 1932, net income of $272,342 after charges and taxes, equivalent after preferred dividends to $2.34 a share on 89,929 no-par shares of common stock.

This compares with $488,987 or $4.60 a share on 90,429 common shares in preceding fiscal year.

New Departure Resumes

BRISTOL, CONN., Aug. 22—The New Departure Ball Bearing plant here, closed since Aug. 4, reopened and is resuming operations at about the same schedules as when closed down.

Single Molecule Makes Hundred Thousand Others Behave, Keeping Gasoline Fresh

Standard Oil Chemists Show Colleagues How Gum Content Can Be Inhibited By Small Amounts of Para-Benzylamino-Phenol

DENVER, Aug. 24—A new process of keeping cracked gasolines fresh and unchanged without carrying out expensive methods of refining and stabilization previously necessary was described to the American Chemical Society today in a paper presented by Drs. T. H. Rogers and Vanderveer Voorhees of Standard Oil Co. of Indiana.

The cracking process, which was developed by Standard of Indiana to increase the yield of gasoline from crude oil, produces a product different in many respects from gasoline distilled directly from crude. For some time cracked gasoline was regarded as an unwelcome but necessary substitute for straight-run gasoline.

As adequate refining methods were developed, it gradually became accepted as fully equivalent to the straight-run product. During recent years it has been recognized that cracked gasolines are superior to straight-run gasolines in anti-knock characteristics, and the cracking process has been the major tool of the refiner in making gasolines of increasing knock rating.

The changes and improvements in the art of cracking, which have been made to get better anti-knock, have also resulted in less stable gasolines, because some of the best anti-knock constituents of cracked gasoline have a tendency on storage to combine with oxygen of the air to form products of a gummy or resinous nature. In addition to gum formation, cracked gasolines, unless properly refined, are likely to suffer loss of anti-knock upon aging.

The presence of an appreciable amount of gum in gasoline would soon be noted by the motorist, because a hard, varnishlike layer is deposited in the gasoline lines and intake system of the engine, eventually stopping the supply of gasoline or interfering with operation of the carburetor and valves.

Refiners have always recognized the possibility of such troubles, and various refining means have been adopted to make cracked gasolines stable during the period of storage and use. The usual methods, such as sulphuric acid treatment, have serious disadvantages because, in general, the valuable knock-suppressing compounds are removed to a considerable extent in the treating process.

Rogers and Voorhees, research chemists working on this problem, discovered that the addition of certain chemical compounds, in very small amount, would prevent the oxidation of cracked gasoline, thus preventing gum formation and loss of anti-knock.

An extended study was made to find the most suitable and effective compound for this purpose. Following this work comes the announcement that para-benzylamino-phenol, a little-known organic chemical compound, is an ideal stabilizer for gasoline.

Various materials have been proposed as stabilizers or inhibitors for cracked gasolines, but the compound mentioned appears to be the most effective as well as the most satisfactory from other standpoints. The amount required to render cracked gasoline stable is from one to three-thousandths of one per cent.

This means that one molecule of the above compound will protect more than a hundred thousand molecules of gasoline against oxidization. The compound has a satisfactory solubility in gasoline and is entirely colorless in gasoline solution, even after prolonged exposure to light.

The extensive research work on this subject has also included tests in engines to determine the effect of storage of cracked gasolines with and without inhibitors, as well as comparative laboratory oxidization and aging tests. A simple laboratory test has also been developed to predict the behavior of gasoline in storage.

Ford Electrical Plant Starts Production

YPSILANTI, MICH., Aug. 24—Production has been started at the Ford Motor Co. plant here with a payroll of approximately 270 men. The plant produces minor electrical parts including switches, coils, etc., for starting and ignition systems.

Vesta Reelects

At the annual stockholders meeting of Vesta Consolidated Corp., held in Chicago, on Aug. 10, H. W. Warden, Jr., was reelected president; J. H. Roberts was elected vice-president, succeeding S. F. Baker, resigned; R. M. Ziegler was elected vice-president; C. W. Messinger, treasurer, and A. H. Townsend, secretary.

Matthews Heads Sales For Sealed Power Corp.

MUSKEGON, Aug. 24—L. G. Matthews has been appointed general sales manager of Sealed Power Corp., John E. Norwood, succeeding Mr. Matthews as export sales manager.

L. F. Iverson has been reelected general manager.

Goodyear Pays $1.75 Dividend

Regular Quarterly on Preferred Voted by Tire Directors

AKRON, OHIO, Aug. 24—Goodyear Tire & Rubber Co. directors meeting today declared the regular quarterly dividend of $1.75 a share on preferred stock of the company, payable Oct. 1, as reported in *Automotive Industries*, Aug. 20.

The semi-annual report to directors for the period ending June 30 listed consolidated earnings of the company for the period at $2,043,445 after deducting depreciation of plant, machinery and equipment, and Federal income tax amounting to $5,342,565.

Deductions for interest on funded debt and funded debt adjustments amounted to $1,515,836, leaving a net profit for the six months of $527,609.

New sales for the period amounted to $68,953,780, the report showed. Cash and government securities on hand amounted to $41,797,727. The ratio of current assets to current liabilities was given as 8.7 to 1.

The Goodyear surplus after deducting the $2,668,956 for dividends was listed as $13,527,750.

Allowances for depreciation and inventory adjustments were unusually large for the six months, directors were told. The company took an inventory writeoff for crude rubber and raw cotton in finished but unsold goods, and wrote the prices of materials on hand down to the low point of the market.

Government securities in the cash account were valued at the market price as of June 30. Capital surplus of the company was listed at $21,867,603, compared with $21,516,181 on Dec. 31, 1931.

Clark Equipment Will Produce Balloon Wheel

BUCHANAN, MICH., Aug. 24—It is reported that production will be located in the Clark Equipment Co. plant in this city on a new wheel designed for use in connection with super-balloon tires, to fit a majority of passenger car makes.

Feragen Distributor For Bendix-Cowdrey

A. E. Feragen, Inc., has been appointed national distributors of Bendix-Cowdrey Brake Tester, Inc.

Mr. Feragen is well known throughout the country as an expert in wheel alignment.

The inventory formerly carried at Lansing by Motor Wheel Corp., has been transferred to South Bend, from which point all orders will be filled except for West Coast business. These will continue to be handled from Seattle as formerly.

Commissioners Meet Industry On Plans to Increase Safety

Highway Accidents Prevention Sought as Eastern Conference of Motor Vehicle Administrators Meet With Car Engineers

NEW YORK, Aug. 24—Additional cooperative measures to advance highway safety were outlined at a meeting of the Eastern Conference of Motor Vehicle Administrators and representatives of the National Automobile Chamber of Commerce, held yesterday at the Chamber headquarters.

While fully aware that increased safety must come largely from better traffic control and from greater care on the part of the motor car drivers, it was agreed that there is a mutuality of interest between the law enforcement officers and manufacturers of cars, trucks and buses that could be made effective in the direction of decreasing highway accidents.

The commissioners, who in this conference represent 18 states with approximately 12,000,000 motor vehicles, declared that changing designs in motor cars, if brought in advance to the attention of the Motor Vehicle Commissioners, would permit early consideration of the necessary legislation for their control.

A number of the manufacturers offered their laboratories and proving grounds for tests that will furnish the administrators with the necessary information in connection with proposed laws on safety.

Representing the Eastern Conference of Motor Vehicle Administrators were Robbins B. Stoeckel, commissioner of motor vehicles, Connecticut, who acted as chairman; Benjamin G. Eynon, commissioner of Pennsylvania; Harold G. Hoffman, commissioner of New Jersey, and W. A. Vanduzer, commissioner for the District of Columbia.

Representing the National Automobile Chamber of Commerce were Delmar G. Roos, the Studebaker Corp. who acted as chairman of the group; George Allen, Chrysler Corp.; W. J. Davidson, General Motors Corp.; L. S. Sheldrick, Ford Motor Co., and Alfred Reeves, vice-president, of the N.A.C.C.

After further fact-finding surveys on the part of each committee, another joint session will be held next month, it is planned.

Mr. Stoeckel's views on the manufacturers' responsibility in regard to highway safety appeared in the July 23, 1932, issue of *Automotive Industries.*

Caterpillar Tractor Shows Assets of $44,381,159

NEW YORK, Aug. 24—The balance sheet of Caterpillar Tractor Co. as of July 31, 1932, shows total assets of $44,381,159, comparing with $47,269,873 on December 31, 1931, and earned surplus of $13,605,501 against $14,891,190.

Current assets as of July 31, last, including $7,164,451 cash and marketable securities, amounted to $25,501,493, and current liabilities were $497,880.

This compares with cash and marketable securities of $8,317,969, current assets of $27,602,901, and current liabilities of $866,905 at close of 1931. Capital stock outstanding amounts to 1,882,240 no-par shares.

Income account of Caterpillar Tractor Co. for seven months ended July 31, 1932, follows: Net sales, $8,698,756; cost and expenses, $7,986,886; gross profit, based on estimated inventory, $711,870; depreciation, $1,009,872; interest paid, $281,818; net loss, $579,820.

Upholds Connecticut Gasoline Tax Law

HARTFORD, Aug. 24—The Supreme Court of Errors upheld the validity of the Connecticut gasoline tax law, enacted in 1925.

An oil company held that the act was unconstitutional because it was not signed by the governor until three days after the state assembly's adjournment.

Craveroiler Receivers Are Named by Court

PHILADELPHIA, Aug. 23—Bevan P. Y. Jordan, Herbert P. Sundheim and Budd G. Nice have been named receivers of the Craveroiler Co. of America by the common pleas court here.

The receivers propose to continue the business.

A. R. Evans With Atlas Tack Corp.

A. R. Evans, formerly assistant purchasing agent at E. G. Budd Mfg. Co., is now connected with Atlas Tack Corp. of Fairhaven, Mass., as their sales representative in this territory with offices in Philadelphia.

Armstrong Spring Moves

FLINT, Aug. 24—Removal of the Armstrong Spring Co. from its plant on Stewart Avenue to its new location in the plant of the Buick Motor Co. has been completed. Among members of Armstrong Spring executive personnel transferred to the Buick organization are S. G. Peckham, T. L. Lang, K. R. Ketzler and A. S. Dryden.

Mrs. E. P. Chalfant Dies in Accident

Wife of N.S.P.A. Executive is Buried in Detroit

Funeral services for Mrs. E. P. Chalfant, who was killed in an automobile accident Saturday evening, were held in Detroit Wednesday afternoon, Aug. 24.

Mrs. Chalfant, with her husband, executive vice-president of the National Standard Parts Association, and their granddaughter, Betsy Jane, 13, were returning to their home in Detroit from Minnesota, where they had spent a vacation.

Near Gould City, Mich., their car collided headlong into an automobile driven by Mrs. George Hastings of Manistique, who had three children with her. Mrs. Hastings was severely injured although her children were only slightly hurt.

Mr. Chalfant was injured, but proceeded to Detroit with Mrs. Chalfant and their granddaughter, who suffered bruises.

Foreign Plants Invade England to Avoid Tariffs

LONDON (*Special*)—Foreign manufacturing plants are springing up all over Great Britain in an effort to avoid the heavy duties imposed by the Empire on foreign imports.

Since January 1, 160 foreign firms have taken factory sites and arranged to manufacture here, according to the London Chamber of Commerce.

Many of these factories have been or are being set up by German firms, which are among the hardest hit by the duties.

Included in the articles formerly imported from Germany now to be manufactured here are leather goods in Hackney, east London; cutlery at Hanwell, coal tar products in Hull.

Czechoslovakian firms are going to manufacture boots, glass, and woodwork; American firms are going to manufacture toys in Dudley, Worcestershire, and electrical goods in London.

Two big factories are to be established soon. One, a German factory, ultimately to employ 1500 people, will be at Grantham for production of rubber shoes. The other is to be built at Hull to employ 200 people for the manufacture of household wooden articles.

Restrains Police From Enforcing Truck Law

LOUISVILLE, Aug. 24—The Ashland (Ky.) Transfer Co. has obtained an order from the circuit court restraining all police officials from attempting to enforce the new laws limiting the length of trucks.

The hearing date has not been set.

General Motors Second Quarter Net Earnings Are $5,326,377

7 Cents Per Common Share As Compared With $1.22 For Second Quarter, 1931; Cash Position Strong, Sloan Reports

NEW YORK, Aug. 26—Net earnings of General Motors Corp., including equities in the undivided profits or the losses of subsidiary and affiliated companies not consolidated, for the second quarter ended June 30, 1932, amounted to $5,326,377. This compares with earnings of $55,122,767 for the corresponding quarter a year ago, according to a report to stockholders made today by Alfred P. Sloan, president.

After deducting dividends of $2,344,208 on the preferred stock, there remains $2,982,169, being the amount earned on the common shares outstanding. This is equivalent to 7 cents per share on the commen stock and compares with $1.22 per share earned in the second quarter of 1931.

Net earnings for the six months ended June 30, 1932, were $15,019,404, or the equivalent, after the deduction of $4,688,415 for preferred dividends, of $10,330,989 or 24 cents per share on the common stock. This compares with earnings of $84,122,176 for the corresponding six months of last year which, after the deduction of preferred dividends, amounted to $1.83 per share earned on the common stock.

Cash, United States Government and other marketable securities at June 30, 1932, amounted to $215,897,767, compared with $205,029,119 at Dec. 31, 1931, and $245,856,668 at June 30, 1931.

Net working capital at June 30, 1932, amounted to $259,632,638, compared with $273,915,923 at Dec. 31, 1931, and $328,651,750 at June 30, 1931.

During the second quarter ended June 30, 1932, General Motors dealers in the United States delivered to consumers 202,060 cars, compared with 361,683 cars in the corresponding quarter of 1931.

Sales by General Motors Operating Divisions to dealers in the United States during this period amounted to 175,447 cars, compared with 369,677 cars in the second quarter of 1931.

The excess of deliveries to consumers over sales to dealers during the second quarter of 1932, therefore, resulted in a decrease of 26,613 cars in dealers' stocks in the United States.

Total sales to dealers, including Canadian sales and overseas shipments, amounted to 197,659 cars, compared with 419,650 cars in the second quarter of 1931.

For the six months ended June 30, 1932, General Motors dealers in the United States delivered to consumers 345,574 cars, compared with 593,564 cars in the corresponding period of 1931.

Sales by General Motors Operating Divisions to dealers in the United States during this period amounted to 341,751 cars, compared with 625,674 cars in the first six months of 1931. The decrease of 3823 cars in dealers' stocks during the first half of 1932 compares with an increase of 32,110 cars during the comparable period of 1931.

Total sales to dealers, including Canadian sales and overseas shipments, amounted to 394,915 cars, compared with 724,197 cars in the corresponding period of 1931.

Harry Tipper Appointed Forbes Advertising Head

Harry Tipper, formerly vice-president and general sales manager of the General Motors Export Division, has been appointed Advertising Director of *Forbes Magazine*, effective Sept. 1.

Mr. Tipper was formerly an executive of the Class Journal Co., where he was business manager of *Automotive Industries*.

As advertising manager of the Texas Co., he was the first man to advertise gasoline in the United States.

Mr. Tipper is a member of the Society of Automotive Engineers, a former president of the Association of National Advertisers, of the Advertising Club of New York and of the Technical Publicity Association.

He organized the School of Marketing at New York University with Professor Hotchkiss and was a member of the faculty for 11 years.

He is the author of "The New Business," "Advertising Campaigns," "Human Factors in Industry," "Discussions on Labor," and "The New Challenge of Distribution" and coauthor of "Advertising Principles and Practices." He has also written a number of articles on technical and economic subjects.

Railway Express Starts Truck Service

CHICAGO, Aug. 24—The first motor truck in the new service of the Railway Express Agency, designed to regain business lost by railroads to motor trucks operating over highways, left the North Western Express Terminal for Milwaukee and intermediate points Monday. The first truck on the South Bend, Ind., run left today.

Will Seek Repeal Of Excise Taxes

Rep. McLeod to Introduce Amendment at Next Session of Congress

DETROIT, Aug. 20—Representative Clarence J. McLeod of Detroit Saturday announced he will introduce an amendment to repeal the automobile excise tax immediately on the convening of congress this fall.

"It is not in keeping with the spirit of our American form of government to resort to taxation of a particular industry and a particular class of citizens, to promote the general welfare of the people as a whole," he said.

"I feel confident that my amendment to repeal this tax and remove a most serious obstacle to increased employment in Detroit will have the immediate approval and hearty support of the administration."

Benjamin Eynon Ousted by King

HARRISBURG, Aug. 24—Benjamin G. Eynon, for many years Pennsylvania's commissioner of motor vehicles and one of the most important commissioners in the country, was ousted as deputy secretary of revenue by Secretary of Revenue Clyde L. King today.

Alleged issuance of "low number" license tags to known gangsters was given by the secretary as the reason. Upon application motorists in this state may obtain plates with their initials and low numbers. Political influence sometimes has entered into this practice, it is said.

Mr. Eynon joined the motor vehicle department in 1919, and as one of the organizers and one-time head of the Eastern Conference of Motor Vehicle Administrators became one of the outstanding officials in the country.

Automobile clubs throughout the state have denounced the action of Mr. King, holding that he used a "flimsy technicality" for removing "a public official of highest calibre."

Armco Grants License

YOUNGSTOWN, Aug. 24—The Stevenson Co., machinery manufacturer, and Materials Handling, Inc., both of Wellsville, Ohio, have been licensed by the American Rolling Mill Co. to manufacture apparatus for shipping steel sheets in floating packs.

Wins Bendix Award

CHICAGO, Aug. 24—Rudolph Rajsky of Cicero won the Vincent Bendix sweepstake for outboard amateurs at the fourth annual St. Joseph's river regatta, South Bend, Ind., Sunday. Jack Maypole and John Hoyones of Chicago finished second and third.

Goodyear-Zeppelin Laboratories Available for Alloy Research

Aluminum, Stainless and High-Tensile Steel Problems Invited; Commercial Poduction Seen If Development Is Justified

AKRON, Aug. 24—Presaging the entrance of the Goodyear-Zeppelin Corp.'s laboratories into a new realm of transportation problems, Dr. Karl Arnstein, vice-president and chief engineer, announces that the laboratories will be made available for the nation's industry in the development of aluminum alloys, high-tensile and stainless steel.

"We have invited industry to bring its construction problems here if aluminum or high-tensile or stainless steel will solve them," Arnstein declared.

"We have accepted some jobs experimentally. We plan immediate entry into commercial production, if experimental effort justifies it."

In a visit to Europe recently, P. W. Litchfield, president of the Goodyear Tire & Rubber Co., parent organization, conducted a study of the uses of duralumin and other aluminum alloys, particularly as used in the bodies of truck trailers and in automobile body parts.

"We have reached the conclusion," Mr. Arnstein announced, "that there is no time better than the present for the inauguration of the new industry, provided the market is ready to absorb its products. Financial conditions have dictated that the nation's business seek efficiency. Industry has become efficiency minded.

"Because of the savings effected by using aluminum alloys, high-tensile and stainless steels, industry can now be expected to turn to these materials wherever weight is a factor of efficiency.

"Goodyear-Zeppelin, in an effort to speed the development of this new industry, is opening its research laboratories and offering its fund of experience and experiments to the nation's business.

"It is prepared to do the engineering for any type of aluminum alloy or stainless steel construction," he announced.

Alloy Taking Steel Tonnage

International Nickel Head Reports Research Work In Furthering Changes

NEW YORK, Aug. 23—The steel age in industry has given way to the alloy age, according to Robert C. Stanley, president of the International Nickel Co. of Canada, Ltd., in a statement issued in conjunction with the semi-annual report of the company's operations. Discussing the possibilities of the use of nickel in alloy, he said in part:

"Nickel would not now enjoy its high standing as an alloying element had not your company deliberately organized to bridge the gap between pure science and industrial practices.

"What is learned in the laboratories and in the field is codified and made known to both the scientists and the industrialists through the continuous service of the information bureaus in supplying literature, illustrated lectures and practical consultations on jobs.

"By constant interchange of information among the bureaus, each one of them can bring to the industrial and engineering problems of the country the world's latest and best data of both pure and applied science."

The report of the company for the six months ended on June 30 shows a net loss, after depreciation, depletion, taxes and other charges, of $93,-255, contrasting with a net profit of $3,359,886, equivalent, after preferred requirements, to 16 cents a share on 14,584,025 common shares, in the first half of last year.

For the quarter ended on June 30, the company showed its first loss since its reorganization in 1928.

After charges, the net loss for the period was $629,327, contrasting with a net profit of $536,072 in the first quarter this year.

A net profit of $1,700,499 was shown in the second quarter last year.

Columbus Auto Parts Co. Declares Regular Dividend

COLUMBUS, Aug. 24 — Columbus Auto Parts Co. has declared the regular quarterly dividend of 50 cents per share on the company's convertible cumulative preferred stock. The company is controlled by Electric Auto Lite Co., Toledo.

The dividend will be paid Sept. 1 to stockholders of record Aug. 24. About $23,500 will be disbursed to holders of about 47,000 shares.

Reed Prentice Names Wolverine as Agent

DETROIT, Aug. 24—Reed Prentice Corp., manufacturers of lathes and drilling machines, has appointed Wolverine Machinery and Supply Co. of Detroit as sales representatives in the Michigan territory.

David C. Forsman has been named western sales manager for the company with headquarters in Detroit. Mr. Forsman was formerly Detroit sales manager.

Sam A. Perkins

Sam A. Perkins, 69, one of the founders of the Waukesha Motor Co., Waukesha, Wis., and its secretary and treasurer throughout its history, died Aug. 15, after a lingering illness.

He was born in Stevens Point, Wis., and went to Waukesha as a youth, rising from a chore boy in a mineral water plant to the financial head of numerous large concerns.

While in the retail hardware business he became acquainted with H. M. Horning, whose son, Harry L. Horning, was carrying on exhaustive experiments in designing heavy-duty gasoline engines. Together they organized the Waukesha Motor Co., of which the younger Horning is now president and chief engineer, and which operates manufacturing properties valued at several millions of dollars.

Mr. Perkins was an officer and director in the Hein-Werner Motor Parts Co., Werra Aluminum Co., Rector Gasifier Co., and other concerns. He also was a director of the Waukesha National Bank, president of the Waukesha Community Hotel Co., trustee of the Waukesha Municipal Hospital, owner of the Manufacturers Building Co. and director of the Industrial Building & Loan Association.

Raybestos-Manhattan Reports Net Loss

NEW YORK, Aug. 24—Raybestos-Manhattan, Inc., for six months ended June 30, reported consolidated net loss after taxes, depreciation and other charges, $117,600, contrasted with $580,179 income, equivalent to 86 cents a share on 676,012 no-par capital shares, last year. Quarter ended June 30.

Net loss after same deductions, $106,728, against $10,872 loss in preceding quarter and net income of $338,-976, or 50 cents a share, in second quarter last year.

Pneumatic Scale Nets 46c a Share

NEW YORK, Aug. 24—Pneumatic Scale Corp., Ltd., and subsidiaries, reported for the year ended May 31 that there was available for common stock, $55,495, equal to 46 cents a share on 120,000 shares after taxes, interest, preferred dividends and other charges.

Ludlum Loss is $140,251

NEW YORK, Aug 23—The Ludlum Steel Co. reports net loss for the six months ended June 30 of $140,251, in contrast to a net profit of $23,488 in the first half of 1931.

For the second quarter of this year alone, the net loss was $89,330, against a net loss of $7,130 in the second quarter of last year.

"Extras" Seen as Steel Bolster

Surcharge for Inspection, Cutting, Chipping, Etc., Seen as Possibility

NEW YORK, Aug. 25—Anticipating broader demand after Labor Day, semi-finished steel producers catering to sheet and strip steel rollers are not only putting somewhat more of their capacity into operation, but are also considering the introduction of new extras covering inspection, cutting and chipping, etc.

Revision of extras has proved in several lines of finished steel an efficient and relatively "painless" method of fortifying the price structure.

With major demand in abeyance, prices for sheets are strictly nominal. Full-finished automobile sheets continue to be quoted on a 2.80 cent, Pittsburgh, basis, but there is so little actual business that there is no telling whether that price could not be shaded by round tonnage buyers.

Jobbing demand continues to furnish the main support of both the sheet and strip market during the present lull in consumer buying.

Strip buying was so light in July that the slight improvement in August served to create a much better feeling in the market and prices are on a fairly even keel, although most of the business coming out is of retail proportions.

Further improvement in the scrap market is interpreted as denoting a corresponding gain in the expectations by the steel industry of business over the last four months of the year.

In conservative circles a minimum enhancement of 10 per cent in the demand over the midsummer rate is confidently counted on while the more optimistic look for a much better showing.

Pig Iron—The market generally shows a better tone, although automotive foundries are virtually out of it for the time being. Prices remain the same.

Aluminum—Middle West secondary aluminum specialists claim to have inquiries for deferred deliveries, but say they are unwilling to extend protection at present prices beyond one or two months. Quotations are unchanged.

Copper—Demand consists chiefly of small tonnages which carry the 5⅝ cents, delivered Connecticut Valley, price.

Tin—Quiet with Straits tin quoted at 22⅞ @ 23 cents.

Lead—Storage battery manufacturers are beginning to cover as far ahead as their October requirements. The market is firm.

Zinc—Dull and unchanged.

Turkey Curbs U. S. Exports

ISTANBUL, TURKEY—The new trade quotas, which will be effective between Oct. 1 and Feb. 15, include automobiles, trucks, chassis, spare parts, tires, agricultural implements, petroleum products, all machinery, electric batteries, pumps and unexposed films. Most of these items come from the United States.

Turkish exporters of wool, mohair, figs, raisins, rugs, olive oil, filberts, rose oils and livestock may import, beyond the quota, goods worth half the value of their exports.

Receivers Named for Foote Bros. Gear Co.

CHICAGO, Aug. 22—The Foote Bros. Gear & Machine Co. was placed in receivership by Judge Wilkerson in the Federal court here today.

Franklin H. Fowler, president of the company, and General Adel Davis, president of the Chicago Title & Trust Co., were named receivers.

The petition was filed by the Ohio Steel Foundry Co., which presented an unpaid claim of $7,259. The bill of complaint declared that the company on June 18 had total assets of $4,357,472 and liabilities of $2,077,865, leaving a net capital of $2,279,607.

Present conditions, according to the complaint, have made it impossible for the company to negotiate loans to meet maturing debts and expensive payrolls.

The debt includes bank loans of nearly a million dollars.

Indestructo Reorganization Is Under Way, Report Says

DETROIT, Aug. 24—Arrangements are nearing completion for the reorganization and refinancing of the Indestructo Glass Co.

Plans call for moving the shatterproof glass division of the company to Detroit or Toledo and using the present plant at Farmingdale, L. I., for the decorative glass only.

The company will require about 100,000 sq. ft. of factory space.

Gabriel Reports Small Net Loss

CLEVELAND, Aug. 24—For the quarter ended June 30, 1932, the Gabriel Co., reports net loss $6,287, compared with net loss of $7,903 in June quarter, 1931.

For six months company reports net loss of $19,733, compared with net profit of $298 in first half of last year.

N. A. Aviation Reports Loss

NEW YORK, Aug. 24—North American Aviation, Inc., and wholly-owned subsidiaries for six months ended June 30, reported net loss after expenses, depreciation, interest, provision for taxes and other charges, $196,688, contrasted with net income of $540,410, equal to 26 cents a share on 2,118,959 shares, last year.

Indiana Plans Tax Diversion

Gasoline Revenues Under Fire, Despite Motor Club Fights Against Changes

CHICAGO, Aug. 24—Although Indiana and Chicago motor clubs vigorously protested and Governor Harry Leslie obtained a ruling which called it illegal, the Indiana legislature, in special session, seemed intent upon passage and enactment of the measure to divert funds from the state gasoline tax for purposes other than those benefiting the motorist. Charles F. Werner, acting for the state attorney general, declared the bills to divert half the fund from the highway department to the counties are unconstitutional. Despite this ruling, legislators passed a number of amendments designed to correct the objectionable features of the bills and passage appeared likely.

Auburn Again in Fourth Place in Registrations

AUBURN, IND., Aug. 24—Early motor car registration figures for the month of July again show Auburn fourth in retail sales in several important centers of the United States, and fifth and six place in many others, N. E. McDarby, vice-president in charge of sales for Auburn, said.

Herrstrom Leaves Budd, Joins Mahoning

Walter S. Herrstrom, formerly with Edw. G. Budd Mfg. Co. Sales and Foreign Engineering Division, is now with The Mahoning Valley Steel Co. as their Eastern sales representative with offices at Philadelphia, Pa.

Moto-Meter Reports $216,733 Net Loss

DETROIT, Aug. 24—Moto-Meter Gauge & Equipment Corp. and subsidiaries report for six months ended June 30, 1932, net loss of $216,733 after taxes, interest, etc., comparing with net loss of $190,314 in first half of 1931.

For quarter ended June 30, 1932, net loss was $108,280 after taxes and charges against net loss of $108,453 in preceding quarter and net loss of $77,101 in June quarter of previous year.

Firestone Sails

AKRON, OHIO, Aug. 24—Harvey S. Firestone, chairman of the board of Firestone Tire & Rubber Co., sailed last week from New York on the Leviathan for a six weeks' visit to Europe.

Motor Vehicle Property Tax is 13 Times as Heavy as Railroad Property Tax

WASHINGTON, Aug. 24—Contending that agitation sponsored by the railroads is to a large extent responsible for the constant pyramiding of motor vehicle taxes, the American Automobile Association made public today figures showing that the tax on motor vehicle property is 13 times as heavy as the tax on railroad property.

The A.A.A. statement was authorized by Thomas P. Henry of Detroit, president of the national motoring body. He said:

"The railroads claim a valuation of $25,000,000,000. On this valuation they paid $354,000,000 in taxes of all kinds in 1930. This was a tax of 1.4 per cent per annum of the valuation.

"In the same year, motor vehicle property had a valuation of $5,500,000,000. On this the motor vehicle owners paid $1,000,000,000 in special taxes, that is, gasoline taxes, registration fees, license fees, etc. This amounted to 18 per cent of the valuation or an annual tax 13 times as heavy as that paid by the railroads.

"It will be objected, of course, that the motor vehicle tax is partly a privilege tax for the use of rights-of-way owned by the states, while the railroads own the capital in their own rights-of-way.

"Let us, for the moment, concede this—although the highway rights-of-way were paid for in large part by the users—and interpret the motor tax in terms of the total investment in highway transportation, namely, highways, rolling stock, garages and terminals. This is estimated at $22,000,000,000.

"On the basis of this estimate, motor vehicle owners are paying 4.5 per cent on the valuation of highway transport, or 3.15 times the tax paid by the railroads.

"While the railroads are seeking to create the impression that highway users are not paying their way, the fact of the matter is that there is nothing in the history of American taxation that compares even remotely with the pyramiding of taxes on the motor vehicle.

"At the present rate of motor taxation, Federal, state and local, the average motor vehicle is paying 175 per cent of its average value in taxes during its life period of seven years.

"This tax is already beginning to affect not only the use of the motor vehicle, but the yield from motor vehicle revenues as well.

"It is not the contention of the American Automobile Association that the railroads are not paying enough taxes. Every industry today is feeling the weight of the tax load, and the railroads are feeling it in common with others.

"Our contention merely is that highway transport is paying an enormous tax bill and that the propaganda of another transportation agency, namely, the railroads, encouraging a heavier tax on highway users, is indefensible."

Julius F. Stone Named Head of "K. & J." Organization

COLUMBUS, Aug. 24—At the annual meeting of stockholders Julius F. Stone, Sr., was elected president of the Case, Crane & Kilbourne Jacobs Co.

He is also president of the Columbus-McKinnon Chain Corp.

Mr. Stone has assumed active direction of Case, Crane & Kilbourne Jacobs Co., and Mr. H. C. Hoeflich has been elected vice-president and sales manager. Mr. Hoeflich has been associated with the company for several years.

Selheimer Promoted By Massey-Harris

D. C. Selheimer, in charge of production at the Racine works of the Massey-Harris Co., has been promoted to factory manager in charge of all manufacturing in the United States. He will also have full charge of the Massey-Harris foundries and factories at Batavia, N. Y., retaining his headquarters in Racine.

H. G. Trelawney has been appointed general superintendent of the Batavia works. He retired recently from the Jaeger Machine Co., Columbus, Ohio, to join Massey-Harris.

Fire Razes Solar Battery Plants

BEAVER DAM, WIS., Aug. 24—Three buildings of the factory group of the Solar Corp., manufacturer of storage batteries, were destroyed by fire recently.

It is expected that the plant will be rebuilt at once. Meantime orders are being filled from other plants elsewhere and from branch warehouses in other cities.

Canadian Shell Oil Buys A. O. Smith Still

MILWAUKEE, Aug. 24—The A. O. Smith Corp. has booked an order for a large cracking still from the Shell Petroleum Co. of Canada.

It is being fabricated of 4-in. steel plate and will be 30 ft. long and 6 ft. in diameter, electrically welded by the exclusive Smith process.

Kissel Plant Sold to Group

Buyers Write "Finis" to Automobile Company's History With Purchase

HARTFORD, WIS., Aug. 24—The final chapter in the history of the Kissel Motor Car Co. here, which began the manufacture of passenger and commercial cars in 1906, has been written by the Circuit court in approving of the sale of the assets and lifting the receivership instituted Oct. 1, 1930.

The purchaser is Hartford Industries, Inc., organized some time ago to represent the interest of the bondholders.

The price is governed by several counter items of expenses, but is said to be but a fraction of the former total bonded indebtedness plus preferred stock issue.

The Kissel plant remains intact. It embraces a large group of buildings so arranged that it is an easy matter to convert them to a large number of lines of diversified industry. Several leases already have been made.

Some time ago the entire supply of replacement parts and materials was sold outright and at present the Stephens Corp., Rockford, Ill., is handling all parts and maintenance needs.

Evans Reports Loss of $90,065 for Half

DETROIT, Aug. 24—Evans Products Co. reports net loss for six months ending June 30 of $90,065 after all charges, comparing with net earnings of $6,980 the first six months of last year.

This compares with net profit of $6,980, equal to three cents a share (par $5) on 244,494 shares of stock in first half of 1931.

For quarter ended June 30, 1932, net loss was $72,702 after taxes and charges comparing with net loss of $17,363 in preceding quarter and net profit of $1,864 equal to one cent a share in June quarter of previous year.

Firestone Promotes McGrath

A. T. McGrath, for the past five years Boston district manager of the Firestone Tire & Rubber Co., has been promoted to northeastern division sales manager.

He is succeeded by W. P. Pearson, formerly manager of the Buffalo, Rochester and Indianapolis branches.

Snap-On Gets Navy Order

KENOSHA, WIS., Aug. 24—Snap-On Tools, Inc., has received a substantial order for tools from the government for delivery to the Navy aircraft factory at Philadephia.

Casings Shipments Reach New High

NEW YORK, Aug. 24—Shipments of pneumatic casings for the month of June were the highest on record, amounting to 10,366,640 casings, an increase of 143.5 per cent over May this year, and were 86.1 per cent above June, 1931, according to statistics released by the Rubber Manufacturers Association, Inc., today.

Production of pneumatic casings for June was 5,643,329 casings, an increase of 47.7 per cent over May this year, but were less than 1 per cent below June, 1931.

Pneumatic casings in the hands of manufacturers June 30 also reached a low point for all time, amounting to 4,625,021 units, a decrease of 50.7 per cent under May 31, and 55.7 per cent below June 30, 1931.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	Production	Inventory
June, 1932	10,366,640	5,643,329	4,625,021
May, 1932	4,258,116	3,820,063	9,378,691
June, 1931	5,571,886	5,672,463	10,447,210

Marland Heads L. C. Chase Co.

SANFORD, ME., Aug. 24—W. H. Marland, president of Sanford Mills, and George B. Ogan, formerly resident partner of the Chase Co. in Chicago, were elected president and general manager respectively of L. C. Chase & Co., Inc., at a meeting held here. W. N. Campbell, president of the Goodall Worsted Co., was elected treasurer, and W. O. Emery of Sanford, clerk.

In addition to these officers, who will also serve as directors, the following were elected to the board: Fred C. Hopewell, president of the Reading Rubber Mfg. Co., and George K. Ripley, president of Troy Mills, of Troy, N. H.

Orders Aircraft Radio Equipment

EAST PITTSBURGH, Aug. 24—An order of more than $100,000 has been received by the Westinghouse Electric & Mfg. Co. from the U. S. Navy for aircraft radio transmitting and receiving equipment.

The equipment will be built in the Chicopee Falls Works—radio product division of Westinghouse.

Buhl Aircraft To Dissolve

LANSING, Aug. 24—Notices of dissolution have been filed on the Buhl Aircraft Co. of Marysville, Mich., with $800,000 capital and 50,000 shares of no par value.

Wise Chrome to Dissolve

LANSING, Aug. 20—Wise Chrome Products Co. of Detroit, with capital of $250,000, has filed notice of dissolution here.

I. C. C. Meets Railroad Executives "Experimental" Freight Rate Slash

WASHINGTON, Aug. 24 — Conferences were held last week between representatives of southwestern railroads and Commissioners Clyde B. Atchison and Hugh Tate of the Interstate Commerce Commission to determine whether or not proposed "experimental" reduced rates of the carriers on cotton shall be allowed to go into effect on Aug. 27 and Sept. 4, the effective dates named in schedules filed with the Commission.

The rates represent sharp slashes and are intended to offset motor truck and barge competition. They cover rates on cotton from Arkansas, Oklahoma, Louisiana, Tennessee and Mississippi points to certain Gulf ports to New England and Canada.

Shippers of other products have protested that the rates would be discriminatory against those applying to rates on their traffic. Barge line interests also protested. Motor truck lines did not.

Inasmuch as the 1932-33 cotton shipping season begins Sept. 1, the Commission announced that the situation called for emergency treatment and for that reason called the conferences.

It is the plan of the carrier to effect a carload system of rates with different minimum carload weights ranging from 25,000-lb. to 65,000-lb. to supplant existing "any quantity" rates now prevailing.

Carriers told the Commissioners that this drastic change was necessary in order to recover traffic on cotton lost to motor trucks and barge lines.

Unless the reduced rates are permitted to become operative, the carriers said, they would be compelled to entirely retire from cotton hauling.

Fixed differentials would govern the carload basis, the rate scaling downward with the increase in the weight of the shipment.

Illustrative of the plan is the proposal that a 35,000-lb. shipment would be rated at 9c per 100-lb. less than a shipment of 25,000-lb. carload minimum, one for 50,000-lb., 15c per 100-lb. less than the 25,000-lb. shipment while a 65,000-lb. shipment would carry a cut of 20c per 100-lb. under the lowest minimum.

The situation was laid before the Commissioners by H. H. Larimore, commerce attorney for the Missouri Pacific.

J. R. Staley, assistant general freight agent for that carrier, said that in the face of a gain in cotton production in the United States revenues of the carrier from cotton traffic have declined from $3,000,000 to $1,000,000 annually.

+ + CALENDAR OF COMING EVENTS + +

FOREIGN SHOWS

London, Olympia Show .....Oct. 13-22
Glasgow, Scottish Motor Show..Nov. 11-19
Paris, Aeronautical Show...Nov. 18-Dec. 4

CONVENTIONS

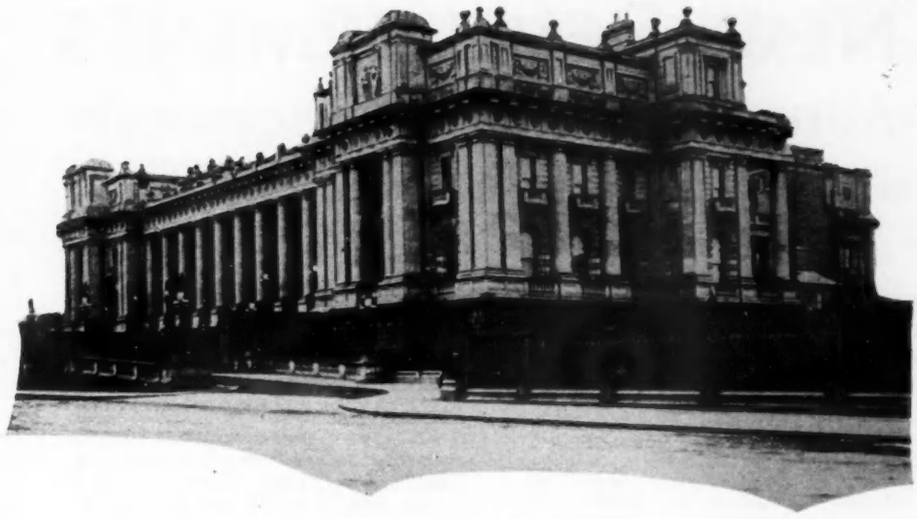
S.A.E. Aircraft Meeting, Cleveland .....Aug. 30-Sept. 1
American Society Mechanical Engineers, Cleveland, Ohio (Machine shop practice meeting) .....Sept. 12-17
American Trade Association Executives, Atlantic City (Annual) .....Sept. 15-17
Penna. Automotive Assn., Harrisburg, Pa. .....Sept. 19-20
Natl. Assoc. of Motor Bus Operators, Chicago .....Sept. 29-30
American Electric Railway Assn., Chicago, Ill. .....Sept. 27-28
Amer. Institute Mining & Met. Engrs. (Petroleum Division), Dallas, Texas .....Sept. 30-Oct. 1
National Metals Congress, Buffalo .....Oct. 3-8
S.A.E. Production Meeting, Buffalo .....Oct. 3
Amer. Society for Steel Treating, Buffalo .....October 3
Amer. Institute Mining & Met. Engrs. (Iron & Steel Division), Buffalo, N. Y. .....Oct. 3-6
National Safety Council, Washington, D. C. .....Oct. 3-7
American Welding Society, Buffalo, N. Y. .....Oct. 3-7
American Society Mechanical Engineers, Buffalo, N. Y. (Natl. Iron and Steel Meeting).....Oct. 3
S. A. E. Annual Transportation Meeting, Toronto .....Oct. 4-6
American Gas Association, Atlantic City (Annual) .....Oct. 10-14
Natl. Hardware Assn. (Accessories Branch), Atlantic City, N. J. .....Oct. 17-22
Natl. Tire Dealers Assoc., Atlanta, Ga. .....Nov. 14-16
American Society Mechanical Engineers, New York City (Annual Meeting) .....Dec. 5-9
Natl. Exposition of Power & Mechanical Engineering, New York .....Dec. 5-10
Highway & Building Congress, Detroit .....Jan. 16-23

RACES

National Air Races, Cleveland .....Aug. 27-Sept. 5
Altoona .....Sept. 5

"... the Australian government seeks to build its industrial structure under the protection of the Imperial Conference agreement ..."

Right: The capitol at Sydney



Free Trade Granted to Dominions By Britain in Ottawa Agreement

(Continued from page 257)

who only a few years ago entered poltics and became a brilliant leader in the Canadian Government.

In the little over a year and a half that have intervened between these conferences, the situation as to tariff policy has radically altered in Great Britain, the Labor Government has been displaced by a National Government whose following in the House of Commons is in overwhelming majority Conservative and Protectionist.

Canada's contribution to the agreement, in addition to her tariff concessions, was her promise to give the British equality of standing with the industrialists of the Dominion before the proposed Canadian Tariff Board in all proceedings to determine the fairness of duties imposed or the method of customs administration in any given case.

But Canada has provided her loopholes by reservations in favor of her "infant industries" and by special reference to the lower wage cost of production in Great Britain as a factor in fixing the terms upon which the United Kingdom manufacturers will be allowed to compete with the Canadians.

Textile manufacturers who resent the fact that Prime Minister Bennett has yielded anything to the British are now remarking cynically that they will be able to depend on their own dominion tariff board to retain for them the protection which the conference agreements have endangered.

Canadian farmers are lukewarm in their enthusiasm over the wheat preference of 6 cents a bushel which Mr. Bennett obtained for them in the United Kingdom markets. Representatives of the lumbering interests in British Columbia are predicting the early ruin of the industry in that province.

Many British economists contend the great mistake was the assumption that the British Empire could be welded into an economic unit under existing world conditions and despite the geographical and economic obstacles which divide the empire countries.

Automotive Representatives

OTTAWA, Aug. 24—Among the representatives of the automotive industry of the United Kingdom and Canada who attended the Imperial Economic Conference, as trade advisers or observers, were:

Col. Alfred Hacking, director, Society of Motor Traders, London; Sir John D. Siddeley, Armstrong Siddeley Motors, Ltd.; Sir W. G. Armstrong, Whitworth, Ltd., and chairman, Society of British Aircraft Constructors, Kenilworth; Arthur Spurrier, director, and W. Eason Humphreys, Leyland Motors, Ltd., London; Peter F. Bennett, British motor car and motorcycle industry; Moir MacKenzie, Federation of British Industries; Sir B. H. Morgan, British Empire Producers Union; G. W. Mullins, representing the Brass and Copper Trades of the United Kingdom; J. Tilbury, of the British Glass Mfrs. Assn.; Hon. J. Howell, British oils and lubricants; A. Vickers, Vickers, Ltd.; A. F. Hemmens, British instrument and meter interests; J. D. Pratt, British chemical manufacturers, and the following Canadian manufacturers:

D. Roy Grossman, president of the Canadian Automobile Chamber of Commerce and vice-president of the Studebaker Corp. of Canada; J. D. Mansfield, president, Chrysler Corp. of Canada, Ltd.; Roy D. Kerby, president, Dominion Motors, Ltd.; T. A. Russell, president, Willys-Overland, Ltd.; H. A. Brown, vice-president and general manager, General Motors Corp. of Canada, Ltd., and J. L. Stewart, general manager of the Canadian Automobile Chamber of Commerce.

But until the parliaments meet upon the Ottawa Conference agreements, no one can tell what world trade changes will be effected. Until then, the greatest politico-economic experiment of all time is in the spotlight of world attention.

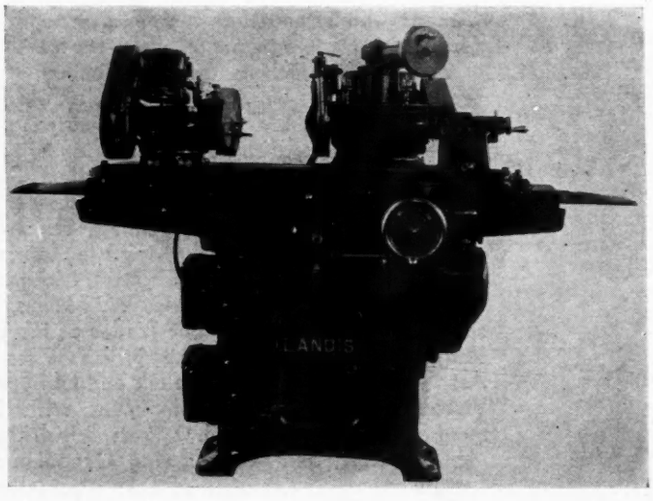
NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Landis Universal Grinding Machine

The 10 in. x 24 in. motor-driven universal grinder recently announced by the Landis Tool Co., Waynesboro, Pa., is designed for the grinding of a variety of light parts manufactured in small lots and for practically all types of tool room work. Technical colleges and schools in need of a grinding machine will find it quite suitable for their requirements.

Controls are conveniently located. The traverse drive motor is mounted entirely within the bed, where it is protected from grit and water. The work drive motor is mounted on the headstock while the wheel drive motor is mounted on the wheel base; this, in connection with a water reservoir which is integral with the bed, making the machine entirely motorized and self-contained. Control of all three motors is from the front of the machine.



The drive from the traverse motor is toward the front of the machine by means of a flat leather belt. Here it is taken through a positive clutch to the final point of application. A three-step cone pulley arrangement, quickly accessible at the side of the machine, makes provision for three traverse speeds. A lever at the front is provided to disengage the clutch when it is desired to traverse the carriage by hand.

The wheel head may be swiveled on its slide, thus permitting the wheel to be set at various angles without influencing the direction of the feeding movement. These units are also mounted on a lower swivel, which can be turned so as to feed the wheel in different directions. A plain wheel feed mechanism is used.

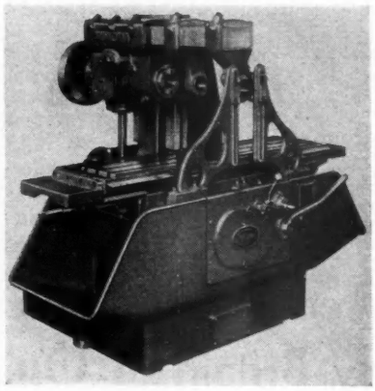
The headstock drive motor is mounted on a hinged plate, the position of which may be quickly changed in order to maintain proper belt tension. Six work speeds are available. A lever at the front of the head may be depressed in order to keep the work from drifting after the motor has been stopped. The spindle may be rotated for live spindle grinding or locked for dead spindle grinding. It is also possible to swivel the upper portion of the head a full 90 deg. for face grinding.

The net weight of the machine without electrical equipment is 3050 lb. A 1/6-hp. work drive motor, a ½-hp. traverse drive motor and a 1-hp. grinding wheel drive motor — along with their starting equipment—are all attached to the machine before shipment.

Sundstrand Stub Lathe and Rigidmil

In line with a policy of constant advance, the Sundstrand Machine Tool Co., Rockford, Ill., has announced important improvements in the 8-in. Stub Lathe and the 3-B Rigidmil.

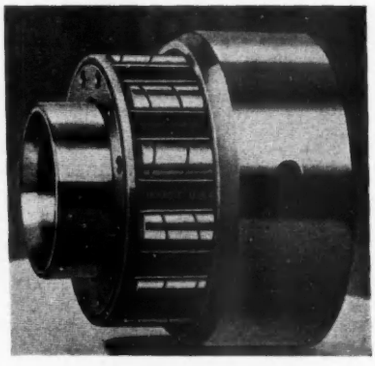
Although the Stub Lathe does not differ greatly in outward appearance, it is practically a new machine by virtue of the added features. It is huskier, more rigid and heavier all around. Another feature is the new drive for carriage feeds which also provides more chip space.



The 3-B Rigidmil, illustrated, not only is improved but differs in appearance from its predecessors. Nineteen new features are responsible for this. Among other things is a more powerful main drive, practically doubled rapid-traverse rates, improved spindle head.

Hyatt Bearings with Spun Cages

A recent development of the Hyatt Roller Bearing Co., Harrison, N. J., is a roller bearing with a spun cage. It comprises end rings with retainer teats or lugs engaging the ends of the rollers, the ring being positioned and securely assembled by spinning over the ends of a cylindrical shell which engages the peripheries of the rings and which is pierced with suitable openings to clear the roller engagement surfaces. Between the openings the shell forms continuous spacing and roller-guiding bars.



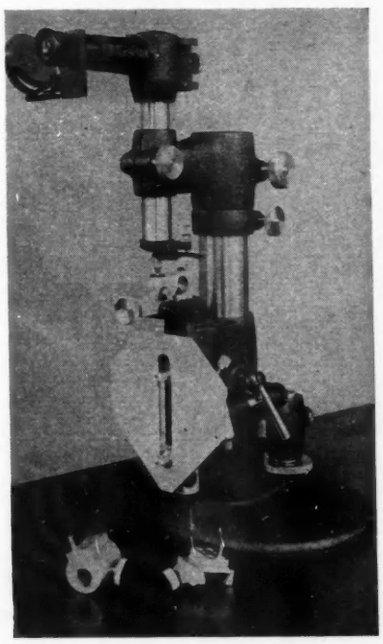
NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

Internal Attachment for Vertical Optimeter

Inside measurements within a range of from ¼ in. to 4 in. in fractions of 0.00005 in. can be obtained with a new adjustable internal attachment which is now available for the Zeiss standard vertical optimeter.

The vertical optimeter heretofore has been limited to outside measurements, but with the new attachment, it is readily converted into an inside comparator gage.

The outstanding features are that the extreme accuracy in measuring within 0.00005 in. is retained, and that the attachment can be adjusted in such a way that bores as small as ¼ in. and as large as 4 in. can be checked with the same equipment. Means are also provided for determining taper and for finding both minimum and maximum diameter of bore.



The attachment is fully self-contained and very massive. It will fit any standard optimeter now in use simply by slipping it over the vertical post and clamping it in position in the rear of the instrument, so as to leave the standard table unencumbered.

Two measuring jaws contact by means of ball tips with the ring to be gaged. The upper one is adjustable, but fixed in position during the measuring operation. The ring is suspended on same by its own weight. The lower one effects the measuring motion and transfers it to the measuring anvil of the optimeter tube, by which the amplification is performed optically, so that 1/10,000 in. will appear as large as 1/16 in. in the ocular, or as ⅛ in. when projected on the screen.

The setting of the instrument is accomplished either by a master ring or a snap gage built up from block gages. An independent fine adjustment for the zero position is provided underneath the measuring anvil.

This attachment, the same as the optimeter, is distributed in this country by the George Scherr Co., 128 Lafayette Street, New York, as agents for Carl Zeiss.

Device Blends Design of Coolant Pump and Machine

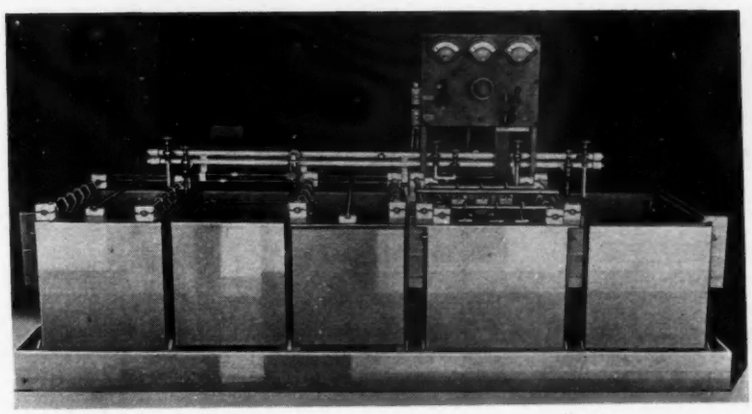
Among the problems involved in the lubrication of machine tools is the blending of the design of the lubricating (or coolant) pump into the machine. And to meet the problem, the Tuthill Pump Co., Chicago, Ill., is now supplying a standard cover, idler pin, idler and rotor (manufactured by mass-production methods) for assembly into the design of the housing most suitable for the purpose.

The machining of the housing or packing box arrangement is simple and can be performed on an engine lathe at a single setting as all bores are circular and concentric. Complete dimensions are furnished by the pump manufacturer to insure proper machining.

Under this system, the designing engineer is permitted almost any combination of port arrangements with assurance of a compact pumping unit.

Compact Chromium Plating Unit

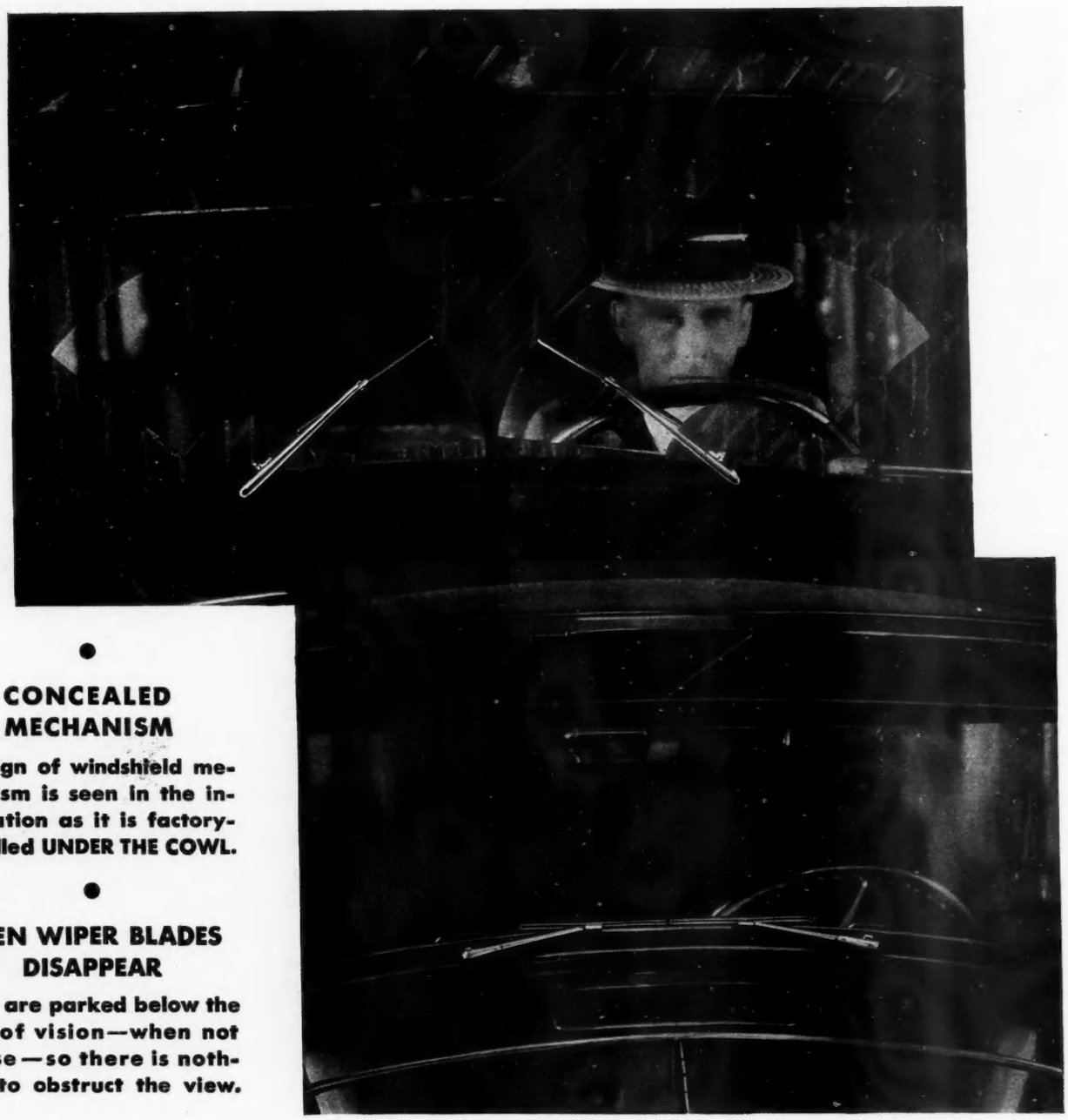
Drills, taps, reamers, files, dies and punches, and many other tools and parts which are made to last longer by chromium plating, may now be plated as a part of the regular routine of the machine shop tool room. United Chromium, Incorporated, of 51 East 42nd St., New York City, has designed a compact chromium plating unit expressly for machine shops.



This new plating unit is so compact that it may be moved right into the tool room, and immediately connected to current, steam, water and waste outlets, and is said to be so simple that it can be successfully operated by almost any workman in the shop. It is said to be economical to use and of sufficient size and versatility to plate the host of tools and parts on which chromium is so useful.

With this new unit in his shop, the superintendent has all of the advantages of chromium plating at his disposal with none of the difficulties and delays incident to sending a part out of the factory or into another department for plating. The machine comes as a unit—with all parts assembled on one base. It is the newest development resulting from the efforts made by United Chromium to give its licensees the benefit of its wide experience, and it has been designed to meet the operating conditions of machine shops.

The ENGINE DRIVEN



CONCEALED MECHANISM

No sign of windshield mechanism is seen in the installation as it is factory-installed UNDER THE COWL.

EVEN WIPER BLADES DISAPPEAR

They are parked below the line of vision—when not in use—so there is nothing to obstruct the view.

ANOTHER STEWART-WARNER PRODUCT . . . . THAT WILL SELL